

## PAKISTAN METEOROLOGICAL SERVICE

Geophysical Observatory

P. O. Box No. 2

Quetta.

GEOPHYSICAL REVIEW

From January 1955, the geophysical work of the Pakistan Meteorological Service will be published on the following scheme :

- Part I. Seismology: Monthly Bulletins and occasional papers.
- Part II. Geomagnetism: Monthly Bulletins, occasional papers and Annual Summary.
- Part III. Atmospheric Physics: Occasional papers.
- Part IV. Half Yearly Technical Progress Review.

Normally each part will be distributed to the Observatories and Institutes within whose field of interest they lie. Those wishing to receive the complete Review, however, may do so by application to the Director of Meteorological Service.

The routine bulletins will continue to be issued in cyclostyled form. It is hoped however that arrangements will be made in the near future for printing the occasional papers.

Arrangements for the exchange of publications will be welcomed.

( S.N. NAQVI )  
Director  
Meteorological Service.



PAKISTAN METEOROLOGICAL SERVICE

Director: S. N. NAQVI



GEOPHYSICAL REVIEW

Vol. I. 1955

Part I. Seismology

No. 2.

Seismological Bulletin

January 1955



QUETTA OBSERVATORY

The following are the constants of the station and the instruments:

Latitude: 30°11'.3 N Longitude: 66°57'.0 E Height: 1719 m.

Foundation: Mountain Fan Gravels.

Normal Microseism Amplitudes  
short period Sprengnether = nil.  
long period Sprengnether = 0.5 mm.

Instruments.

1. Milne Shaw E.
2. Sprengnether Series H N, E.  
Sprengnether Series DH Z.
3. Sprengnether Series H N, E.  
long period
4. Wilmore Z, N, E.

Constants.

Compt.	To Pend. (Sec)	T Galv. (Sec)	Vs.	<i>u</i>	Paper speed (mm/min.)
N	2	1.8	1.8	-	Critical 60
	3	21.6	21.6	-	Critical 30
	4	1	$\frac{1}{4}$	-	Critical 53
E	1	12	-	350	20:1 16
	2	1.8	1.8	-	Critical 60
	3	22.7	22.7	-	Critical 30
	4	1	$\frac{1}{4}$	-	Critical 53
Z	2	1.8	1.8	-	Critical 60
	4	1	$\frac{1}{4}$	-	Critical 53

The Observatory is also equipped with a Sprengnether table pen recorder, driven by a  $1\frac{1}{2}$  period horizontal Sprengnether and photo-electric amplifier.

Time Control.

1. Standard Electric Time Coy (Mass.) invar pendulum clock.
2. Synchronome free pendulum clock.

Greenwich time signals are received three to six times daily on B.B.C. wavelengths and recorded by hand on all seismograms.

Jeffreys & Bullen's 1948 tables are used unless otherwise mentioned. Except when a depth has been mentioned, interpretations assume a surface focus.

Readings are from Sprengnether short period seismograms unless indicated as follows :

Milne Shaw : (M)  
 Wilmore : (W)  
 Long Period Sprengnether : (L)



January, 1955.

## Q U E T T A

DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
1	(W)Z (W)E	eP iS	03 55 03.8 31.8		
1	(W)Z	eP	10 47 55		USCGS: H - 10:34:41. 28 $\frac{1}{2}$ <sup>o</sup> N., 44 <sup>o</sup> W. North Atlantic Ocean.
1	(W)Z	eP	11 02 47		USCGS: H - 10:49:32. 28 $\frac{1}{2}$ <sup>o</sup> N., 44 <sup>o</sup> W. North Atlantic Ocean.
1	(W)Z	e	17 09 49		
1	(W)Z,Z (L)E	iP eL	18 15 24 45.1		USCGS: H - 18:03:08. 51 <sup>o</sup> N., 178 $\frac{1}{2}$ <sup>o</sup> W. Andreanof Islands, Aleutian Islands.
1	(W)Z,Z	iP	18 49 51		USCGS: H - 18:37:41. Depth: about 60 km. 51 $\frac{1}{2}$ <sup>o</sup> N., 178 $\frac{1}{2}$ <sup>o</sup> W. Andreanof Islands, Aleutian Islands.
2	(W)Z,Z	iP	02 21 18		USCGS: H - 02:09:50. Western New Guinea.
2	(W)Z,Z (W)N	iP iS	04 12 52.8 13 39.0	3 <sup>o</sup> .8 420	H - 04:11:52.
2	(W)Z,Z (L)E	eP e(S)	20 11 55 16 57		
3	Z	eP	01 14 20		USCGS: H - 01:07:02. 39 <sup>o</sup> N., 22 <sup>o</sup> E. Central Greece.
3	(W)Z,Z	iP	01 45 26		
3	(W)Z,Z	eP	02 40 44		
3	(W)Z,Z	eP	10 32 46		
3	(W)Z,Z (L)E	ePKP ePP	19 01 22 04 32		USCGS: H - 18:41:50. Depth: about 60 km. Near coast of Peru.
3	(W)Z,Z (L)E (L)E (L)E	iP i i i	19 36 25 45 54 47 23 50 14		USCGS: H - 19:29:16. Near west coast of Sumatra.
4	(W)Z,Z (L)E	iP eL	04 32 16 43.7		
4	(W)Z,Z (L)E,N (L)E	iP i i	12 10 06 13 03 58		
5	(W)Z,Z	eP	00 08 27		



January, 1955.

DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
5	(W)Z,Z Z (M)E (M)E	ePKP iPP iPS iSS	01 08 59 10 13 19 52 26 20	117° 13000	H - 00:50:12. (Using travel times of PKP and PP). USCGS: H - 00:50:12. 50°S., 162½°E. Off coast of South Island, New Zealand. Mag: 6½ - 6¾.
5	(W)Z,Z	iP	01 19 35		
5	(W)Z,Z	iP	15 39 25		USCGS: H - 15:28:18. 54½°N., 161°E. Near east coast of Kamchatka.
5	(W)Z,Z	iP	17 26 14		
5	(W)Z E	eP eSKS	18 02 58 13 43		USCGS: H - 17:48:35. 16°S., 167½°E. New Hebrides Islands. Mag: 6¾ (Pas.)
5	(W)Z,Z (W)N (W)N	iP i iS	18 34 44.5 55.2 35 33.1	4° .1 460	H - 18:33:39.
5	(W)Z (M)E (M)E (M)E	eP eSKS iPS i	23 56 27 00 07 09 10 31 14 09		USCGS: H - 23:42:03. 16°S., 167½°E. New Hebrides Islands. Mag: 6¾ - 7 (Pas.) Damage on Malekula.
6	(W)Z,Z	iP	05 14 37		USCGS: H - 05:04:24. 42½°N., 148°E. Hokkaido, Japan.
6	Z	eP	10 02 43		USCGS: H - 09:48:19. 16°S., 167½°E. New Hebrides aftershock.
6	(W)Z,Z	iP	11 16 37		
6	(W)Z	iP	13 54 16		
6	(W)Z,Z (L)E	eP e(S)	19 34 24 38 38		
7	(W)Z (W)E	iP iS	08 52 38 54 05	7° .5 830	H - 08:50:45.
7	(W)Z (W)N	eP iS	09 46 31 47 48	6° .6 730	H - 09:44:50.
7	(W)Z,Z E Z,(L)N (L)N (L)N (L)N	iP i iPP iS i M	09 53 08 54 09 55 01 10 00 04 03 55 14.1	47° .7 5300	H - 09:44:28. USCGS: H - 09:44:28. 16½°S., 78°E. Indian Ocean.



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
8	Z (M)E (L)E (L)E	eP ePP iPPP i(SKS)	07 47 39 52 10 54 27 58 37		USCGS: H - 07:33:36. Depth: about 60 km. 11 $\frac{1}{2}$ $^{\circ}$ S., 166 $\frac{1}{2}$ $^{\circ}$ E. Santa Cruz Islands. Mag: 6 $\frac{3}{4}$ - 7.
8	(W)Z	eP	09 10 33		USCGS: H - 09:00:32. 31 $\frac{1}{2}$ $^{\circ}$ N., 141 $^{\circ}$ E. Off south coast of Honshu, Japan.
9	(W)Z,Z (L)N (L)N	eP eS M	00 38 55 47 51 01 11.4	67 $^{\circ}$ .5 7500	H - 00:27:55. USCGS: H - 00:27:48. 54 $\frac{1}{2}$ $^{\circ}$ N., 162 $^{\circ}$ E. Near east coast of Kamchatka.
9	(W)Z,Z	e	04 36 20		
9	Z	e	08 02 15		
9	(W)Z (W)E,Z (L)E	eP iS eL	22 08 24 10 45 12.8	12 $^{\circ}$ .5 1390	H - 22:05:22.
10	(W)Z	e	01 13 07		
10	(W)Z	e	02 49 11		
10	(W)Z,Z Z E	iP i iS	04 27 32 52 28 53	7 $^{\circ}$ .4 820	H - 04:25:48. USCGS: H - 04:25:44. Depth: about 100 km. 37 $^{\circ}$ N., 71 $^{\circ}$ E. Hindu Kush.
10	(W)Z (W)N	iP eS	12 02 26 03 46	6 $^{\circ}$ .9 770	H - 12:00:41.
10	(W)Z,Z	iP	22 12 36.3		
11	(W)Z,Z	iP	01 12 00		
11	(W)Z (W)EN	eP eS	03 56 27 58 40	11 $^{\circ}$ .7 1300	H - 03:53:36.
11	Z	eP	07 45 46		USCGS: H - 07:35:36. Near south coast of Honshu, Japan. Felt: Tokyo & Yokohama.
11	(W)Z,Z	eP	09 28 24		USCGS: H - 09:21:12. 35 $^{\circ}$ N., 23 $\frac{1}{2}$ $^{\circ}$ E. Western Crete.
11	(W)Z,Z (L)N (L)E	iP eS M	13 57 31 14 04 59 22.7	52 $^{\circ}$ .9 5880	H - 13:48:11. USCGS: H - 13:48:11. 27 $^{\circ}$ N., 127 $\frac{1}{2}$ $^{\circ}$ E. Ryukyu Islands.
11	(W)Z,Z (W)E	iP iS	20 13 40 14 57	6 $^{\circ}$ .6 730	H - 20:11:59.
12	(W)Z	e	01 51 17		



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DATE	COMPT.	PHASE	GMT			$\Delta$ km.	REMARKS
			h.	m.	s.		
12	(W)Z,Z	iP	01	59	58	5 <sup>o</sup> .2 580	H - 01:58:37.
	(W)EN	iS	02	01	00		
12	(W)Z	iP	02	12	59	6 <sup>o</sup> .8 760	H - 02:11:16.
	(W)E	iS		14	18		
12	(W)Z	e	09	27	59		
13	(W)Z,Z	eP	02	16	18	25 <sup>o</sup> .8 2870	USCGS: H - 02:03:43. 53 <sup>o</sup> N., 167 $\frac{1}{2}$ <sup>o</sup> W. Fox Islands, Aleutian Islands. Felt: Unalaska.
	(L)N	i		26	18		
	N	iSKS			44		
	Z	eP'iP'		42	31		
13	(W)Z,Z	iP	02	48	20	25 <sup>o</sup> .8 2870	USCGS: H - 02:35:45. 53 <sup>o</sup> N., 167 $\frac{1}{2}$ <sup>o</sup> W. Fox Islands, Aleutian Islands. Felt: Unalaska.
	(W)E,N,E	iSKS		58	47		
13	(W)Z,Z	iP	02	57	21		USCGS: H - 02:44:47. Fox Islands aftershock.
13	(W)Z,Z	e	03	03	43		
13	(W)Z	e	09	59	42		
13	(W)Z	e	11	02	29		
13	(W)Z,Z	iP	15	58	17		
13	(W)Z	e	17	40	42		
13	(W)Z	e	17	52	04		
13	(W)Z	e	20	23	37		
14	(W)Z,Z	iP	07	49	53	25 <sup>o</sup> .8 2870	H - 07:44:30. Depth: about 100 km. USCGS: H - 07:44:40. Depth: about 100 km. Assam-Burma border region.
	(W)ZE	ipP		50	08		
	(W)N	i			16		
	(L)N	eS		54	13		
	NE,(L)E	i			18		
	N	i			31		
14	(W)Z	iP	11	41	03.8		
14	(W)Z	iP	18	30	22	7 <sup>o</sup> .0 780	H - 18:28:36.
	(W)E	iS		31	43		
15	(W)Z,Z	eP	20	05	33		USCGS: H - 19:55:14. 35 <sup>o</sup> N., 141 <sup>o</sup> E. Near east coast of Honshu, Japan.
16	(W)Z	e	03	46	37		
16	(W)Z	e	09	56	23		
16	(W)Z	eP	12	17	08	6 <sup>o</sup> .7 740	H - 12:15:26.
	(W)E	eS		18	26		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
16	(W)Z,Z	eP	13 38 57		USCGS: H - 13:30:15. Near south coast of Sumatra.
16	(W)Z,Z (W)E	eP eS	15 43 25 45 11	9°.2 1020	H - 15:41:08.
16	(W)Z,Z	e	16 17 10		
16	(W)Z,Z	eP	23 33 32		USCGS: H - 23:21:45. Indian Ocean, about 350 miles northeast of Prince Edward Islands.
17	(W)Z,Z Z	eP i	02 31 54 32 11		USCGS: H - 02:21:46. 36½°N., 139½°E. Honshu, Japan. Felt: Tokyo & Yokohama.
17	(W)Z,Z	1PKP	02 58 54		USCGS: H - 02:40:17. Depth: about 200 km. 20°S., 176½°W. Tonga Islands.
17	(W)Z,Z	e	05 36 16		
17	(W)Z,Z (L)N	iP iS	15 40 52 45 33	27°.6 3070	H - 15:35:01.
17	(W)Z,Z	e	16 02 17		
17	(W)Z,Z (L)NE	eP e(S)	18 00 49 10 03		
17	(W)Z,Z (L)E	eP e(S)	19 48 08 52 51		
17	(W)Z,Z	e	20 14 06		
17	(W)Z,Z	e	21 08 12		
18	(W)Z,Z	1PKP	14 54 40		USCGS: H - 14:36:32. Depth: about 400 km. 19°S., 179°W. Samoa Islands.
18	(W)Z,Z (L)E (L)E (L)E	ePKP e i e	17 11 42 13 01 25 02 29 04		USCGS: H - 16:51:26. 36½°S., 98½°W. Southeast of Easter Island.
18	Z (L)E (L)E	ePP eSKS ePS	20 06 46 13 30 16 14		USCGS: H - 19:48:36. Santa Cruz Islands region.
19	(W)Z,Z (W)Z,Z	iP i	03 50 14 59		
19	(W)Z (L)N	iP e(S)	22 35 13 37 43		
19	(W)Z	e	23 30 48		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
20	Z (L)N	ePKP M	04 08 13 05 12.9		USCGS: H - 03:48:45. 15°N., 104½°W. Off coast of Mexico. Mag: 6¼ (Pas.)
20	(W)Z (L)EN (L)E (L)E	eP e(S) e i	07 36 12 39 50 43 17 45 11		
21	Z Z,E	eP iS	01 40 08.2 24.8		Felt Sibi and Pishin, Baluchistan.
21	(W)Z (W)N	iP iS	03 20 20 21 35	6° .4 710	H - 03:18:42.
21	(W)Z (W)E	eP iS	11 11 34.8 12 07.3	2° .5 280	H - 11:10:52.
21	(W)Z,Z	iP	14 31 10		USCGS: H - 14:18:33. 53°N., 168°W. Fox Islands, Aleutian Islands. Felt: Unalaska & Adak.
21	(W)Z (W)E	eP e(S)	15 43 24 45 03		
22	(W)Z (W)E	eP i(S)	00 14 39 16 08		
22	(W)Z (L)N (L)N (L)E	eP eS i M	05 36 00 41 57 45 09 50.5	38° .6 4290	H - 05:28:34. USCGS: H - 05:28:35. 8°S., 67½°E. Chagos Islands region.
22	(W)Z,Z	iP	15 32 08		
22	(W)Z,Z	ePKP	21 28 45		USCGS: H - 21:11:00. Depth: about 650 km. Fiji Islands.
22	(W)Z,Z	e	21 49 13		
22	(W)E	e	23 59 19		
23	(W)Z,Z E (L)E E	eP iPP i eS	22 30 32 32 36 37 50 38 01	53° .0 5890	H - 22:21:11. USCGS: H - 22:21:14. Near southwest coast of Java.
24	(W)Z	e	00 43 17		
24	(W)Z	ePKP	01 09 07		USCGS: H - 00:49:20. 4°S., 104°W. Southwest of Galapagos Islands.
24	(W)Z,Z (L)E	eP eL	10 36 32 44.6		



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DATE	COMPT.	PHASE	GMT			$\Delta$ km.	REMARKS
			h.	m.	s.		
24	(W)Z,Z	iP	17	20	17		
24	(W)Z,Z (W)E	iP iS	17	37	12	6 <sup>o</sup> .1	H - 17:35:38.
				38	24	680	
25	Z (L)E	eP eL	04	18	52		USCGS: H - 04:09:30. Off south coast of Java.
				38.6			
25	Z	e	08	02	16		
25	Z	eP	14	59	54	57 <sup>o</sup> .4	H - 14:50:01.
	E	eS	15	07	50	6380	USCGS: H - 14:50:05.
	(M)E	eL		20.2			80 <sup>o</sup> N., 3 <sup>o</sup> W.
	(L)E	M		25.3			Arctic Ocean, off west coast of Spitzbergen.
26	Z	e	02	02	41		
26	Z	ePKP	03	09	10		USCGS: H - 02:50:00. About 500 miles south of Juan Fernandez Islands.
26	Z	iP	06	00	23	5 <sup>o</sup> .9	H - 05:58:52.
	Z	i			30	660	
	N,E	eS		01	32		
	(L)E	eL		03.5			
26	Z	e	18	48	57		
26	Z	e	19	16	27		
26	Z	e	23	46	58		
26	Z	e	23	59	44		
27	Z	eP	04	23	31		
	E	i(S)		25	10		
27	E	e	06	59(33)			
27	(W)E,E	e	13	34	05		USCGS: H - 13:11:34. Depth: about 60 km. Off coast of Oaxaca, Mexico.
27	(W)Z	e	15	24	09		
27	(W)Z,E	eP	16	26	05		USCGS: H - 16:16:05.
	(L)E	M		51.0			43 <sup>o</sup> N., 140 $\frac{1}{2}$ <sup>o</sup> E. Near west coast of Hokkaido, Japan.
27	(W)Z,E	ePKP	18	56	33		USCGS: H - 18:38:20. Depth: about 400 km. 17 $\frac{1}{2}$ <sup>o</sup> S., 177 <sup>o</sup> W. Fiji Islands region.
27	(W)Z,E	iP	22	47	42	6 <sup>o</sup> .9	H - 22:45:57.
	(W)N,E	iS		49	02	770	
28	(W)Z	eP	01	56	44		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
28	(W)Z (W)EN	eP eS	07 49 11 54 53	36 <sup>o</sup> .4 4040	H - 07:42:03. USCGS: H - 07:42:00. Off south coast of Crete.
28	(W)Z,Z Z (W)E,E	eP iPPP iS	17 05 47 06 06 08 15	13 <sup>o</sup> .1 1460	H - 17:02:37. USCGS: H - 17:02:33. 33 <sup>o</sup> N., 82 <sup>1</sup> / <sub>2</sub> <sup>o</sup> E. Tibet.
28	(W)Z (W)E,E	eP eS	17 48 48 51 22	13 <sup>o</sup> .7 1520	H - 17:45:30.
28	E	e	23 55 14		
29	E	e	01 00 30		
29	E	e	01 41 58		
29	E	e	06 39 39		
29	E	e	09 00 22		
29	E (L)N (L)N (L)E,(M)E	eP eS eSS M	17 14 41 23 39 28 11 48.8	67 <sup>o</sup> .9 7540	H - 17:03:38. USCGS: H - 17:03:35. 51 <sup>1</sup> / <sub>2</sub> <sup>o</sup> N., 159 <sup>1</sup> / <sub>2</sub> <sup>o</sup> E. Off southeast coast of Kamchatka.
30	Z	eP	09 03 49		
30	(W)E	eP	13 01 25		
30	(W)Z,Z	eP	15 42 12		
30	Z	e	23 45 50		
31	Z	iP	02 39 47		USCGS: H - 02:27:12. Andreanof Islands, Aleutian Islands.
31	Z Z,E (L)N	iPKP e M	05 22 08 23 57 06 07.6		USCGS: H - 05:03:03. 12 <sup>1</sup> / <sub>2</sub> <sup>o</sup> S., 57 <sup>o</sup> W. Mato Grosso, Brazil. Mag: 6 <sup>3</sup> / <sub>4</sub> (Pas.)
31	Z	eP	09 56 36		
31	(W)Z (W)Z	ePKP i	15 22 48 23 03		USCGS: H - 15:03:04. Central Chile. Felt.
31	(W)Z,Z Z (W)Z E (L)E (L)N (L)N,E (L)N (M)E Z (M)E	iP i iPcP i iPP iPcS iS eSS eL eP'P' M	16 12 59 13 16 22 14 37 15 20 17 33 21 53 26 08 38.9 41 27 46.5	67 <sup>o</sup> .1 7460	H - 16:02:02. USCGS: H - 16:02:07. 46 <sup>1</sup> / <sub>2</sub> <sup>o</sup> N., 153 <sup>o</sup> E. Kurile Islands. Mag: 6 <sup>1</sup> / <sub>4</sub> - 6 <sup>1</sup> / <sub>2</sub> (Pas.)
31	(W)Z,Z	eP	20 24 40		

( Abdul Qadir Khan )



PAKISTAN METEOROLOGICAL SERVICE

Director: S. N. NAQVI

GEOPHYSICAL REVIEW

Vol. I. 1955

Part I. Seismology

No. 3.

Seismological Bulletin

February 1955



February, 1955.

Q U E T T A

DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
1	Z	e	03 32 57		
1	Z	e	08 17 31		
1	Z	e	14 40 32		
1	(W)Z,Z	iP	19 26 17	61°.2	Compression.
	Z	i	39	6800	H - 19:15:58.
	Z	iPcP	59		USCGS: H - 19:16:02.
	Z	i	29 12		42°N., 142 $\frac{1}{2}$ °E.
	E	eS	34 36		Off south coast of
	(L)NE	i	36 33		Hokkaido, Japan.
	(L)N	iL	49.9		
	Z	oP'P'	55 51		
	(L)N	M	56.0		
1	(W)Z,Z	iP	20 30 33		USCGS: H - 20:19:45. 25° N., 142° E. Volcano Islands.
2	Z	oPKP	07 41 23		USCGS: H - 07:22:32.
	(L)E	eL	08 24.7		Depth: about 100 km. Tonga Islands.
3	Z	oPKP	12 59 46		USCGS: H - 12:41:24.
	(L)N	eL	13 38.3		44°N., 128 $\frac{1}{2}$ °W.
	(L)N	M	47.6		About 200 miles off coast of Oregon. Mag: 5.3 (Pas.)
3	(W)Z,Z	e	15 28 24		
3	Z	e	15 38(06)		
3	(W)Z,Z	e	18 29 13		
3	(W)Z	e	19 34 50		
4	Z	e	05 24 07		
4	Z	eP	05 28 15	37°.5	H - 05:20:58.
	(L)N	eS	34 04	4170	
4	(W)Z,Z	iP	07 30 24	46°.9	H - 07:21:50.
	(L)N	iS	37 15	5210	USCGS: H - 07:21:49.
	(L)N	i(SS)	40 55		17° S., 67° E. Mascarene Islands region.
4	Z	e	10 03 11		
5	(W)Z,Z	iP	05 53 08		USCGS: H - 05:42:14. 47° N., 154° E. Kurile Islands.
5	(W)Z,Z	e	14 19 31		USCGS: H - 14:09:05. Off east coast of Kamchatka.
5	(W)Z,Z	eP	18 57 48		
	(L)E	e(S)	19 04 40		



February, 1955.

DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
5	(W)Z,Z (W)Z (L)N (L)N (M)E (L)N	iP iPcP iS iScS eL M	20 52 42 53 07 21 01 29 02 45 18.9 24.9	66 <sup>o</sup> .0 7330	Compression. H - 20:41:52. USCGS: H - 20:41:51. 46 $\frac{1}{2}$ <sup>o</sup> N., 153 <sup>o</sup> E. Kurile Islands.
5	(W)Z,Z	eP	21 57 22		USCGS: H - 21:46:32. 47 <sup>o</sup> N., 153 <sup>o</sup> E. Kurile Islands.
6	(W)Z,Z (L)E (L)E	iP iS iSSS	01 05 35 13 48 20 00	60 <sup>o</sup> .2 6690	H - 00:55:23. USCGS: H - 00:55:32. 71 <sup>o</sup> N., 13 $\frac{1}{2}$ <sup>o</sup> W. Jan Mayen Islands region.
6	(W)Z,Z Z (L)E (L)E (L)E	iP iPP iS i M	02 37 54 40 03 46 08 51 48 03 06.2	60 <sup>o</sup> .3 6700	Rarefaction. H - 02:27:41. USCGS: H - 02:27:53. 71 <sup>o</sup> N., 13 $\frac{1}{2}$ <sup>o</sup> W. Jan Mayen Islands region.
6	(W)Z	e	04 43 21		USCGS: H - 04:34:55. Near south coast of Sumatra.
6	(W)Z	iPKP	10 24 29		USCGS: H - 10:05:45. Sandwich Islands region.
6	(W)Z,Z (W)N (L)E (L)E	iP iS i M	14 55 07 57 36 59 34 15 00.6	13 <sup>o</sup> .2 1470	H - 14:51:56. USCGS: H - 14:51:53. Western Sinkiang Province, China.
6	(W)Z,Z	eP	18 29 20		USCGS: H - 18:17:05. 50 $\frac{1}{2}$ <sup>o</sup> N., 180. Andreanof Islands, Aleutian Islands.
7	(W)Z,Z	eP	00 21 27		USCGS: H - 00:10:58. 44 <sup>o</sup> N., 146 $\frac{1}{2}$ <sup>o</sup> E. Southern Kurile Islands.
7	(W)Z,Z (W)E,E	eP iS	08 28 03 29 19	6 <sup>o</sup> .5 720	H - 08:26:24.
7	(W)Z,Z (W)E (W)E	eP i i	13 15 47 17 22 58		
7	(W)Z,Z (W)E	iP iS	14 37 58 39 14	6 <sup>o</sup> .5 720	H - 14:36:19.
7	(W)Z,Z	eP	20 06 58		USCGS: H - 19:56:40. 34 $\frac{1}{2}$ <sup>o</sup> N., 141 <sup>o</sup> E. Near coast of Honshu, Japan.
8	(W)Z	eP	04 25 35		
8	(W)Z,Z	ePKP	04 30 37		USCGS: H - 04:12:10. Depth: about 600 km. 20 <sup>o</sup> S., 62 $\frac{1}{2}$ <sup>o</sup> W. Southern Bolivia.



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DATE	COMPT.	PHASE	GMT			$\Delta$ km.	REMARKS
			h.	m.	s.		
8	(W)Z	eP	15	53	22		USCGS: H - 15:43:07. Near south coast of Honshu, Japan.
	(L)E	eL	16	17	43		
9	(W)Z	eP	03	39	23	11 <sup>o</sup> .0 1220	H - 03:36:41.
	(W)E	eS		41	28		
9	(W)Z, Z	iP	10	38	42	13 <sup>o</sup> .7 1520	H - 10:35:24. USCGS: H - 10:35:24. 33 <sup>o</sup> N., 83 <sup>o</sup> E. Tibet.
	(L)E, E	iS		41	16		
	(M)E, (L)E	iL			42.7		
	(M)E, (L)E	M			44.5		
9	Z	e	11	15	45		
9	Z	e	19	07	07		
10	(W)Z, Z	eP	00	14	12	66 <sup>o</sup> .4 7380	H - 00:03:19. USCGS: H - 00:03:21. Depth: about 60 km. 50 <sup>o</sup> N., 156 <sup>o</sup> E. Northern Kurile Islands.
	(L)N	eS		23	02		
	(L)N	eSS		27	12		
	(L)N	M			46.6		
10	(W)Z, Z	ePKP	09	55	47		USCGS: H - 09:36:41. Tonga Islands.
10	(W)Z	e	20	35	44		
11	(W)Z	iPKP	04	49	17		USCGS: H - 04:30:30. Kermadec Islands region.
11	(W)Z	eP	18	46	44	7 <sup>o</sup> .6 840	H - 18:44:49.
	(W)E	iS		48	12		
11	(W)Z, Z	iP	21	31	30.7		
	(W)N, E	iS			58.2		
	(L)N	i		32	03.4		
12	(W)Z, Z	iP	00	59	50.2		Felt Quetta. USCGS: H - 00:59:45. Pakistan foreshock.
12	(W)Z	e	03	48	41		
12	(W)Z	e	14	31	49		
13	(W)Z, Z	iP	17	27	35		USCGS: H - 17:16:55. Depth: about 200 km. 56 <sup>o</sup> N., 160 <sup>1</sup> / <sub>2</sub> E. Central Kamchatka.
14	(W)Z, Z	eP	17	03	39	62 <sup>o</sup> .8 6980	H - 16:53:09. USCGS: H - 16:53:09. 2 <sup>o</sup> N., 126 <sup>1</sup> / <sub>2</sub> E. Molucca Passage. Mag: 6 <sup>1</sup> / <sub>4</sub> (Pas,)
	(L)N	iS		12	08		
	(L)N	M			33.6		
14	(W)Z, Z	iP	19	37	32		USCGS: H - 19:27:04. 3 <sup>o</sup> N., 126 <sup>1</sup> / <sub>2</sub> E. Molucca Passage.
15	(W)Z, Z	e	00	03	09		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
15	(W)Z,Z (L)E (L)E (L)E (L)E	ePKP iSKSP iSS iSSS M	06 38 39 49 20 54 51 58 40 07 35.2		USCGS: H - 06:20:18. Depth: about 60 km. $13\frac{1}{2}^{\circ}$ S., $166\frac{1}{2}^{\circ}$ E. New Hebrides Islands.
15	(W)Z,Z (W)E	eP iS	10 16 54 18 14	$6^{\circ}.9$ 770	H - 10:15:09. USCGS: H - 10:15:00. Hindu Kush.
15	(W)Z,Z	eP	13 54 32		
15	Z	ePKP	18 59(55)		USCGS: H - 18:41:47. New Hebrides Islands.
16	(W)Z,Z Z,E (W)Z (L)N (L)N	iP ipP isP iS isS	11 41 00 49 42 00 49 55 50 52	$71^{\circ}.0$ 7890	H - 18:29:53. (Gutenberg Tables) Depth: about 150 km. USCGS: H - 11:29:54. Depth: about 150 km. $7^{\circ}$ S., $130^{\circ}$ E. Banda Sea.
16	(W)Z	eP	14 48 29		
17	(W)Z (W)EN	eP iS	02 42 19 43 40	$7^{\circ}.0$ 780	H - 02:40:33.
17	(W)Z	e	03 41 20		
17	(W)Z	iP	19 39 03		USCGS: H - 19:30:42. $38\frac{1}{2}^{\circ}$ N., $13\frac{1}{2}^{\circ}$ E. Near north coast of Sicily.
17	(W)Z (W)N	iP iS	22 11 07 12 34	$7^{\circ}.5$ 830	H - 22:09:14.
18	(W)Z	e	03 34 53		
18	(W)Z	e	19 53 33		
18	(W)Z	iP	22 48 38.1		H - 22:48:35. $30^{\circ}18'.5N$ , $66^{\circ}57'.5E$ . (Based on aftershocks - see note attached ) Intensity: VII(Modified Mercalli Scale) Depth: about 5 km. Felt area: 20,000 sq.miles. USCGS: H - 22:48:33. $30\frac{1}{2}^{\circ}$ N., $67^{\circ}$ E. Pakistan.
The earthquake stopped the pendulum clocks. They remained under adjustment for about 48 hours.					
21	(W)Z,Z (W)N	iP eS	14 08 27 09 46	$6^{\circ}.8$ 760	H - 14:06:44.
21	Z	eP	23 26 31		USCGS: H - 23:14:45. $40\frac{1}{2}^{\circ}$ N., $24^{\circ}$ W. Azores Islands.



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
22	(W)Z,Z	iP	14 57 14		USCGS: H - 14:48:26. 25 $\frac{1}{2}$ $^{\circ}$ N., 122 $\frac{1}{2}$ $^{\circ}$ E. Off northeast coast of Formosa.
23	(W)Z,Z	ePKP	05 15 19		USCGS: H - 04:57:11. Depth: about 250 km. 20 $^{\circ}$ S., 175 $\frac{1}{2}$ $^{\circ}$ W. Tonga Islands.
23	(W)Z,Z	iPKP	11 58 52		USCGS: H - 11:41:02. Depth: about 600 km. 18 $^{\circ}$ S., 178 $^{\circ}$ W. Fiji Islands.
23	(W)Z,Z (L)E (L)EN	iP eS iS	18 42 29 51 14 20	65 $^{\circ}$ .6 7290	H - 18:31:41. USCGS: H - 18:31:45. 34 $^{\circ}$ S., 54 $\frac{1}{2}$ $^{\circ}$ E. Indian Ocean.
23	(W)Z	eP	20 11 58		USCGS: H - 20:01:30. 32 $^{\circ}$ N., 141 $^{\circ}$ E. South of Honshu, Japan.
23	(W)Z,Z	iP	23 17 21		USCGS: H - 23:13:30. 28 $^{\circ}$ N., 85 $\frac{1}{2}$ $^{\circ}$ E. Nepal.
24	(W)Z,Z Z E	iP i i	13 39 55 40 27 42 30		
24	(W)Z (L)E	iP i	15 19 10 22 32		USCGS: H - 15:15:19. Nepal.
26	(W)Z,Z (W)E (L)N (L)N	iP i iS iL	00 39 34 44 46 00 49.2	43 $^{\circ}$ .0 4780	H - 00:31:31. USCGS: H - 00:31:14. 0 $^{\circ}$ , 102 $^{\circ}$ E. Sumatra.
26	Z	e	12 04 46		
27	(W)Z,Z	iP	19 30 44		USCGS: H - 19:20:38. Off south coast of Honshu, Japan.
27	(W)Z	e	20 59 21		
27	(W)Z,Z (L)E E (M)E	iPKP iPP i iSKKS	21 02 28 04 25 05 02 11 31		USCGS: H - 20:43:24. 27 $\frac{1}{2}$ $^{\circ}$ S., 176 $^{\circ}$ W. Kermadec Islands region. Mag: 8 (Pas.) 7 $\frac{3}{4}$ - 8 (Berk).
28	(W)Z,Z	iP	01 11 05		USCGS: H - 00:58:39. 52 $^{\circ}$ N., 174 $^{\circ}$ W. Andreanof Islands, Aleutian Islands.
28	(W)Z,Z	eP	08 25 57		
28	Z	e	15 24 42		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
28	Z	iP	20 50 21	41 <sup>o</sup> .7	H - 20:42:29.
	(L)N	iS	56 39	4630	USCGS: H - 20:42:31.
	(L)N	iSS	59 50		11 <sup>o</sup> S., 66 $\frac{1}{2}$ <sup>o</sup> E.
	(L)N	M	21 08.7		Indian Ocean.

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Quetta Earthquake of 18 February 1955.

1. The main shock occurred at 22:48:35 on 18 February 1955, and was followed by innumerable aftershocks for the next 48 hours which made it impossible to read P & S. Of these about 12 were felt during the following 3 hours.
2. Aftershocks were later recorded on portable Wilmore seismographs at 3 temporary field stations. These records enabled the main epicentral region to be located at  $30^{\circ} 18'.5$  N,  $66^{\circ} 57'.5$  E and the depth of focus of about 5 kms. to be calculated. The nearest field station was located about 3 kms. south of the main epicentre.

Aftershocks occurred along a line of about 15 kms. parallel to the outcrop of a major thrust fault 8 kms. east.

Small aftershocks are still occurring at time of writing (April 1955).
3. Damage to villages was experienced over an area 500 square miles mainly north of Quetta. Mud structures were destroyed, but timber framed village houses suffered only superficial damage.
4. Little or no structural damage occurred to earthquake resistant structures in and around Quetta. The Quetta Municipal Building Code calls for a seismic factor of  $1/8$  g. The main damage in Quetta was to un-reinforced compound walls.
5. A total of 7 people were killed by the earthquake. Of these 5 were killed in villages due to collapse of mud build houses.
6. The death rate in the villages would have been much higher, but for the foreshock of 12th Feb. '55 which caused most of the villagers to sleep in the open.
7. The intensity at the epicentre was VII (Modified Mercalli), and the area of perceptibility 20,000 square miles. It has not been possible to determine the magnitude, but from the above data it appears to be about 6.





PAKISTAN METEOROLOGICAL SERVICE

Director: S. N. NAQVI

GEOPHYSICAL REVIEW

Vol. I. 1955

Part I. Seismology

No. 4.

Seismological Bulletin

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Q U E T T A

DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
1	(W)Z,Z	e	02 15 56		
1	(W)Z,Z Z Z	iP i iS	04 55 29 56 05 05 51	83°.6 9290	H - 04:42:58. USCGS: H - 04:42:59. 65°N., 133°W. Yukon. Mag: 6½ - 6¾ (Pas.) 6½ (Berk)
1	(W)Z,Z (L)E	iP iS	14 14 55 25 19	84°.0 9330	H - 14:02:22. USCGS: H - 14:02:25. 65° N., 133° W. Yukon aftershock.
1	(W)Z,Z	iP	14 52 10		USCGS: H - 14:41:37. 29½° N., 141½° E. South of Honshu, Japan.
1	(W)Z,Z (L)E	eP eS	17 25 17 30 29	32°.1 3570	H - 17:18:46. USCGS: H - 17:18:55. Near Maldiva Islands, Indian Ocean.
1	(W)Z,Z	e	17 56 05		
1	(W)Z,Z	e	19 20 43		USCGS: H - 19:11:19. Off north coast of Java.
1	(W)Z,Z	e	22 19 32		
1	(W)Z,Z	e	22 27 17		
2	(W)Z,Z	eP	01 31 44		USCGS: H - 01:18:53. 4½° S., 151½° E. New Britain Island.
2	(W)Z,Z	eP	01 49 41		USCGS: H - 01:35:45. 4° S., 152½° E. New Britain Island.
2	(W)Z,Z	eP	03 43 48		
2	(W)Z,Z	e	17 20 32		
3	(W)Z,Z (L)E	eP iS	00 49 27 54 17	28°.9 3210	H - 00:43:24.
3	(W)Z,Z	eP	04 38 15		
3	(W)Z,Z	eP	20 57 03		USCGS: H - 20:47:22. 71½° N., 4½° W. Jan Mayen Island.
3	(W)Z,Z	eP	23 34 28		
4	(W)Z,Z	e	03 56 36		



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DATE	COMPT.	PHASE	GMT		$\Delta$ km.	REMARKS
			h.	m. s.		
5	(W)Z,Z	ePKP	03	48 59		USCGS: H - 03:29:58. Depth: about 150 km. 14° N., 90½° W. Guatemala.
5	(W)Z,Z	iP	05	40 27		USCGS: H - 05:29:46. 3° N., 127½° E. Molucca Passage.
5	(W)Z,Z (W)E	iP iS	10	24 45 26 05	6° .9 770	H - 10:23:00. USCGS: H - 10:22:46. Hindu Kush.
6	(W)Z,Z	e	02	34 59		
6	(W)Z,Z (L)E	iP eS	06	26 22 32 53	43° .8 4870	H - 06:18:13. USCGS: H - 06:18:01. 2½° S., 100° E. Near south coast of Sumatra.
6	(W)Z,Z (L)EN	iP iS	11	05 07 12 53	55° .7 6190	H - 10:55:27. USCGS: H - 10:55:28. 9½° N., 122½° E. Philippine Islands foreshock.
6	(W)Z,Z (W)N (L)EN	eP i iS	13	43 11 23 50 57	55° .7 6190	H - 13:33:31. USCGS: H - 13:33:31. 9½° N., 122½° E. Negros Islands, Philippine Islands.
6	(W)Z,Z (W)EN	iP iS	20	57 38 59 18	8° .7 970	H - 20:55:28. USCGS: H - 20:55:10. 37½° N., 72° E. Tadzhik, S. S. R.
7	(W)Z	ePKP	15	06 14		USCGS: H - 14:47:10. 27½° S., 176° W. Kermadec Islands region.
8	(W)Z,Z	eP	23	41 08		USCGS: H - 23:30:29. Depth: about 60 km. 50½° N., 156° E. Off south coast of Kamchatka.
9	(W)Z,Z (L)E (L)N (L)E (L)E	iP iPP iS i M	09	28 00 29 55 35 03 39 10 51.1	48° .8 5420	H - 09:19:11. USCGS: H - 09:19:13. Off north coast of Formosa. Felt: Taipei.
9	(W)Z	eP	11	31 31		
10	(W)Z,Z	e	10	40 52		
10	(W)Z	e	17	44 35		



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DATE	COMPT.	PHASE	GMT			$\Delta$ km.	REMARKS
			h.	m.	s.		
10	(W)Z,Z (W)E	eP i(S)	18	41	48 42 24		
10	(W)Z (W)N	iP iS	19	26	32 27 10		
10	(W)Z,Z	eP	21	18	25		USCGS: H - 21:16:20. 32 $\frac{1}{2}$ ° N., 77° E. Northern India.
11	(W)Z,Z	eP	03	17	51		
11	Z	ePKP	09	30	00		USCGS: H - 09:10:44. 16° N., 98° W. Near coast of Oaxaca, Mexico.
11	(W)Z,Z	eP	17	22	48		
11	(W)Z,Z	eP	21	54	33		USCGS: H - 21:43:40. 52° N., 158° E. Kamchatka.
11	Z (L)E	iP eS	23	42	39 50 49	59° .7 3630	H - 23:32:30. USCGS: H - 23:32:46. 8° N., 124° E. Near northwest coast of Mindanao, P.I. Several injured & minor damage at Ozamis City.
12	(W)Z,Z Z (W)E (L)N	iP i iS i	16	44	02 36 45 21 46	6° .9 770	H - 16:42:17. Felt: Hazara Frontier Province. USCGS: H - 16:42:15. 35° N., 73 $\frac{1}{2}$ ° E. India - Pakistan border.
13	(W)Z,Z	eP	04	14	44		USCGS: H - 04:03:53. Depth: about 60 km. 49 $\frac{1}{2}$ ° N., 155 $\frac{1}{2}$ ° E. Kurile Islands.
13	(W)Z,Z	eP	05	32	46		USCGS: H - 05:23:24. Depth: about 200 km. Negros Island region, Philippine Islands.
13	(W)Z,Z	eP	15	10	42		
13	(W)Z	e	15	24	04		
13	(W)Z,Z (W)E (W)E E	iP i iS M	17	00	22 01 08 02 04 03.2	8° .9 990	H - 16:58:09. USCGS: H - 16:58:00. Southern Iran.
13	(W)Z	eP	19	41	41		
14	(W)Z,Z	eP	00	24	44		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
14	(W)Z,Z	eP	02 21 58		
14	(W)Z,Z Z (L)N (L)EN	iP ipP iS isS?	13 24 17 48 34 21 35 21	81°.9 9100	H - 13:12:07. Depth: about 100 km. USCGS: H - 13:12:04. Depth: about 100 km. 52½° N., 173½° W. Andreanof Islands, Aleutian Islands. Mag: 7 (Pas), Berk 6½ (Berk).
14	(W)Z	iP	17 26 54		USCGS: H - 17:13:45. Solomon Islands.
15	(W)Z,Z Z (L)N	eP e eS	08 18 28 45 22 56	26°.1 2900	H - 08:12:51. USCGS: H - 08:12:57. Burma - India border.
15	(W)Z (W)N	eP eS	17 07 01 08 18	6°.6 730	H - 17:05:20.
16	(W)Z,Z	eP	01 53 49		
16	(W)Z,Z	eP	02 20 21		USCGS: H - 02:07:43. 52° N., 167° E. Fox Islands, Aleutian Islands.
16	(W)Z,Z	eP	06 49 56		
16	Z	eP	13 18 19		USCGS: H - 13:05:53. 3° S., 13° W. Off coast of Liberia.
16	(W)Z	eP	20 21 20		USCGS: H - 20:12:22. Off east coast of Formosa.
16	(W)Z,Z (W)E,E	iP iS	20 41 17 42 33	6°.5 720	H - 20:39:38. USCGS: H - 20:39:20. 38° N., 71° E. Hindu Kush.
16	(W)Z,Z (W)Z,Z (W)Z,Z	ePKP e e	22 05 29 07 08 11 01		USCGS: H - 21:45:14. 26½° S., 115° W. Easter Island region.
17	(W)Z (L)E	eP iSKS	17 47 41 58 16	94°.5 10,500	H - 17:34:18. USCGS: H - 17:34:24. New Britain.
17	(W)Z,Z	e	20 38 27		
18	(W)Z,Z (L)N Z	iP iS eP'P'	00 17 45 26 42 46 00	67°.5 7500	H - 00:06:45. USCGS: H - 00:06:42. 54½° N., 161° E. Near east coast of Kamchatka.
18	(W)Z	e	03 27 41		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
18	Z	e	04 46 52		
18	(W)Z	e	06 57 38		
18	(W)Z	e	09 09 33		
18	(W)Z	e	09 26 32		
19	Z	e	08 07 16		
19	(W)Z	e	17 26 16		
19	(W)Z	e	20 08 39		
19	(W)Z	e	20 11 03		
19	Z	eP	22 56 02		
19	(W)Z	iP	23 49 34		USCGS: H - 23:38:25. Near east coast of Kamchatka.
20	(W)Z	iP	00 46 20		USCGS: H - 00:35:13. 53 $\frac{1}{2}$ $^{\circ}$ N., 161 $^{\circ}$ E. Off east coast of Kamchatka.
20	(W)Z	e	08 44 03		
20	(W)Z	ePKP	20 32 39		USCGS: H - 20:13:42. Depth: about 150 km. 15 $^{\circ}$ N., 92 $^{\circ}$ W. Guatemala.
20	(W)Z	e	23 22 17		
21	(W)Z,Z (L)NE (L)NE	eP iS iSS	00 59 25 01 05 26 08 19	39 $^{\circ}$ .2 4350	H - 00:51:54. USCGS: H - 00:52:00. 200 miles west of Chagos Islands, Indian Ocean.
21	(W)Z (L)E	eP eS	13 07 54 12 38	29 $^{\circ}$ .2 3240	H - 13:02:00. USCGS: H - 13:02:05. Depth: about 100 km. 26 $^{\circ}$ N., 98 $\frac{1}{2}$ $^{\circ}$ E. China - Burma border.
22	Z (L)E (L)E	eP eS iS	02 44 40 54 08 16	73 $^{\circ}$ .3 8140	H - 02:33:05. USCGS: H - 02:33:09. 45 $^{\circ}$ N., 28 $^{\circ}$ W. North Atlantic Ocean.
22	(W)Z,Z E E	eP i eS	06 19 55 22 25 24 42	28 $^{\circ}$ .5 3170	H - 06:13:56. USCGS: H - 06:14:00. 26 $^{\circ}$ N., 98 $\frac{1}{2}$ $^{\circ}$ E. Burma.
22	(W)Z	e	11 14 35		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
22	(W)Z,Z Z N (M)E (M)E	iP iPP eS eSS M	14 13 29 15 16 20 13 23 34 33.7	45 <sup>o</sup> .8 5090	H - 14:05:04. USCGS: H - 14:05:04. 8 $\frac{1}{2}$ <sup>o</sup> S., 92 <sup>o</sup> E. Indian Ocean. Mag: 7 (Pas.)
23	(W)Z	iP	01 57 02		
23	(W)Z,Z (L)EN (L)EN	iP iS iSS	05 02 56 09 33 12 50	44 <sup>o</sup> .7 4970	H - 04:54:39. USCGS: H - 04:54:31. Indian Ocean aftershock.
23	(W)Z (L)N	ePKP e	17 34 35 50 57		USCGS: H - 17:16:17. 56 $\frac{1}{2}$ <sup>o</sup> S., 147 <sup>o</sup> E. Southwest of Macquarie I.
23	(W)Z,Z	iP	22 37 02		USCGS: H - 22:27:16. 10 $\frac{1}{2}$ <sup>o</sup> N., 124 <sup>o</sup> E. Cebu Island, Philippine Is.
24	(W)Z,Z	eP	16 19 14		
24	(W)Z,Z	eP	18 03 34		USCGS: H - 17:53:20. Kurile Islands.
24	(W)Z (W)N	iP iS	22 39 49 41 07	6 <sup>o</sup> .7 740	H - 22:38:07.
25	Z	e	02 28 15		
25	(W)Z,Z	eP	23 03 08		USCGS: H - 22:52:28. Depth: about 100 km. 52 <sup>o</sup> N., 156 <sup>o</sup> E. Near west coast of Kamchatka.
26	(W)Z E	eP e	15 21 49 23 45		
26	(W)Z	iP	20 25 18		
27	(W)Z	eP	09 44 20		USCGS: H - 09:33:18. Depth: about 60 km. 53 $\frac{1}{2}$ <sup>o</sup> N., 162 <sup>o</sup> E. Near east coast of Kamchatka.
27	(W)Z	eP	14 08 23		USCGS: H - 13:59:40. 22 $\frac{1}{2}$ <sup>o</sup> N., 120 $\frac{1}{2}$ <sup>o</sup> E. Near south coast of Formosa.
27	(W)Z,Z (M)E,E	eP e(S)	14 43 22 46 55		USCGS: H - 14:38:44. 30 <sup>o</sup> N., 90 <sup>o</sup> E. Eastern Tibet.
28	(W)Z	iP	09 21 39		USCGS: H - 09:12:09. 29 <sup>o</sup> N., 130 <sup>o</sup> E. Ryukyu Islands.



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
28	(W)Z (W)E	iP iS	14 03 56 05 17	7 <sup>o</sup> .0 780	H - 14:02:10.
28	(W)Z,Z	eP	14 53 12		USCGS: H - 14:45:46. 38 <sup>o</sup> N., 21 <sup>o</sup> E. Near southwest coast of greece.
28	(W)Z	eP	19 47 04		USCGS: H - 19:42:16. 43 <sup>o</sup> N., 46 <sup>o</sup> E. Daghestan U. S. S. R.
30	(W)Z	iP	01 32 53		USCGS: H - 01:22:40. 31 <sup>o</sup> N., 138 <sup>o</sup> E. South coast of Honshu, Japan.
30	(W)Z	eP	05 02 55		USCGS: H - 04:51:43. 55 <sup>o</sup> N., 164 <sup>o</sup> E. Near east coast of Kamchatka.
30	(W)Z	e	05 05 45		
30	(W)Z	e	17 30 20		
31	(W)Z (W)Z	iP iS	13 22 05 23 25	6 <sup>o</sup> .9 770	H - 13:20:20.
31	(W)Z,Z (W)N	iP i	18 26 53 27 17		USCGS: H - 18:17:00. 8 <sup>o</sup> N., 124 <sup>o</sup> E. Near northwest coast of Mindanao, P.I. Mag: 7 $\frac{1}{2}$ (Pas.), (Berk). About 425 killed and several million dollars damage to property.
31	(W)Z,Z (M)E	iP eS	21 02 35 10 36	58 <sup>o</sup> .2 6470	H - 20:52:37. USCGS: H - 20:52:39. 8 <sup>o</sup> N., 124 $\frac{1}{2}$ <sup>o</sup> E. Mindanao aftershock. Felt.
31	(W)Z,Z	e	23 45 17		
31	(W)Z,Z	iP	23 50 46		USCGS: H - 23:40:53. 8 <sup>o</sup> N., 124 $\frac{1}{2}$ <sup>o</sup> E. Philippine Islands aftershock.

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PAKISTAN METEOROLOGICAL SERVICE

Director: S. N. NAQVI

GEOPHYSICAL REVIEW

Vol. I. 1955

Part I. Seismology

No. 5.

Seismological Bulletin

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QUETTA OBSERVATORY

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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
1	Z (L)NE (L)NE	eP eS eL	18 51 56 19 00 27 07.2	63°.2 7020	H - 18:41:24. USCGS: H - 18:41:27. 64° N., 21° W. Iceland.
3	(W)Z,Z	iP	00 03 48		Dilatation. USCGS: H - 23:53:42. Depth: about 400 km. 53½° N., 154½° E. Off west coast of Kamohatka.
4	(W)Z,Z (L)NE	iP iS	11 20 12 27 17	49°.1 5450	Compression. H - 11:11:21. USCGS: H - 11:11:21. 22° N., 121° E. Near south coast of Formosa. Mag: 6 (Pas.)
4	(W)Z	ePKP	19 43 19		USCGS: H - 19:24:04. 13° N., 87° W. Nicaragua. Mag: 6¼ (Pas.)
4	(W)Z,Z (W)E	iP iS	21 32 32 33 57	7°.3 810	H - 21:30:42.
5	(W)Z	e	02 27 47		
5	(W)Z,Z	iP	03 17 59		Dilatation. USCGS: H - 03:07:52. Near southwest coast of Mindanao.
5	(W)Z (L)NE	eP eS	11 34 38 43 50	70°.3 7810	H - 11:23:21. USCGS: H - 11:23:17. 13° N., 142½° E. Marianas Islands region.
5	(W)Z	eP	13 57 38		USCGS: H - 13:48:46. 21½° N., 121° E. Off south coast of Formosa.
5	(W)Z,Z (L)NE	iP eS	14 11 31 18 30	48°.1 5345	Compression. H - 14:02:48. USOGS: H - 14:02:46. 23° N., 121° E. Formosa.
5	(W)Z,Z	ePKP	15 28 27		USCGS: H - 15:09:15. 25° N., 110° W. Gulf of California. Mag: about 7 (Pas.)



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5	(W)Z	ePKP	16 35 40		USCGS: H - 16:16:24. 24 $\frac{1}{2}$ $^{\circ}$ N., 110 $^{\circ}$ W. Gulf of California aftershock.
5	(W)Z,Z	e	19 27 44		
6	Z (L)N,(M)E	eP iS	12 59 28 13 06 26	48 $^{\circ}$ .0 5335	H - 12:50:45. USCGS: H - 12:50:50. 17 $\frac{1}{2}$ $^{\circ}$ S., 66 $\frac{1}{2}$ $^{\circ}$ E. Mascarene Islands region. (very large amplitude of S in (L)N!)
6	(W)Z,Z (L)NE	iP iS	19 59 38 20 08 27	66 $^{\circ}$ .3 7370	Dilatation. H - 19:48:46. USCGS: H - 19:48:46. 33 $\frac{1}{2}$ $^{\circ}$ S., 87 $^{\circ}$ E. Indian Ocean.
6	(W)Z,Z	e	20 28 13		
7	(W)Z (W)N	eP iS	16 18 27 19 38	6 $^{\circ}$ .1 680	H - 16:16:53.
7	(W)Z,Z (W)E	iP i(S)	20 45 20.5 46 10.9		
7	(W)Z	iP	20 48 17.5		
7	(W)Z,Z (L)E	eP M	23 03 12 35.6		USCGS: H - 22:52:08. Kurile Islands.
8	(W)Z,Z	e	02 23 47		
8	Z	e	02 56 15		
8	(W)Z,Z	e	03 17 20		
8	(W)Z	e	13 43 37		
8	(W)Z,Z (L)N	eP i(S)	22 01 19 05 26		
9	(W)Z (W)N	eP eS	10 40 02 41 22		
9	Z	i	15 51 54		Dilatation. USCGS: H - 15:21:41. 10 $^{\circ}$ S., 75 $^{\circ}$ W. Central Peru.
9	Z	e	16 17 00		
10	(W)Z,Z (W)N (L)NE	eP iPcP eS	17 48 07 49 05 56 04	57 $^{\circ}$ .5 6390	H - 17:38:14. USCGS: H - 17:38:12. 8 $^{\circ}$ N., 125 $^{\circ}$ E. Philippines aftershock. Many injured, moderate damage in Lanao Province.



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11	(W)Z,Z	eP	01 03 00		USCGS: H - 00:50:21. 6° S., 147½° E. Near northeast coast of New Guinea.
11	(W)Z,Z	eP	16 39 25		
11	(W)Z,Z	eP	17 26 53		
12	(W)Z,Z	eP	10 10 51		
12	(W)Z	e	12 51(35)		
12	(W)Z	e	13 45 00		
12	(W)Z,Z	eP	18 14 40		USCGS: H - 18:02:03. 52° N., 170° W. Fox Islands, Aleutian Islands.
13	(W)Z	iP	11 49 04		USCGS: H - 11:40:20. 24° N., 120½° E. Near east coast of Formosa.
13	(W)Z,Z	iP	20 53 02		Dilatation. USCGS: H - 20:45:45. 37½° N., 22° E. Southern Greece.
14	(W)Z,Z (W)N	eP iS	01 02 49 04 22	8°.1 900	H - 01:00:47. USCGS: H - 01:00:46. Northern India.
14	(W)Z	eP	01 35 11		USCGS: H - 01:28:58. 30° N., 101½° E. Sikang province, China. Mag: 7¼ (Pas), 7 (Berk).
14	(W)Z	eP	04 18 58		USCGS: H - 04:07:45. Near south coast of Kamchatka.
14	(W)Z,Z	eP	12 38 07		USCGS: H - 12:25:34. 52½° N., 170° W. Fox Islands, Aleutian Islands.
14	(W)Z,Z (W)Z,Z	ePKP i	15 41 13 38		USCGS: H - 15:21:20. Neuquen province, Argentina.
14	(W)Z,Z	eP	20 55 49		
15	(W)Z	e	03 16(11)		
15	(W)Z,Z (W)E	eP iS	03 43 40 45 49	11°.4 1280	H - 03:40:53. Felt at Rawalpindi. USCGS: H - 03:40:52. 40° N., 74½° E. Kirghiz S. S. R. Mag: 7 (Pas), 6¾ - 7 (Berk).



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
15	(W)E	e	04 13 53		
15	(W)E (W)E	eP iS	04 16 12 18 26	11 <sup>o</sup> .8 1310	H - 04:13:19. Felt at Rawalpindi. USCGS: H - 04:13:23. 40 <sup>o</sup> N., 75 <sup>o</sup> E. Kirghiz aftershock.
15	(W)Z	iP	13 02 30		
16	(W)Z,Z (L)E	iP eL	21 51 40 22 18.6		Dilatation. USCGS: H - 21:40:30. 53 <sup>1</sup> / <sub>2</sub> <sup>o</sup> N., 162 <sup>o</sup> E. Near east coast of Kamchatka.
17	(W)Z,Z	eP	01 30 46		
17	(W)Z,Z (L)NE	eP eS	03 54 23 58 22	22 <sup>o</sup> .0 2445	H - 03:49:26. USCGS: H - 03:49:32. 28 <sup>1</sup> / <sub>2</sub> <sup>o</sup> N., 90 <sup>o</sup> E. India-Bhutan border.
17	(W)Z,Z (L)E	eP eS	12 38 28 40 09	8 <sup>o</sup> .8 980	H - 12:36:17.
17	Z (L)N	eP eL	12 59 50 13 27.0		USCGS: H - 12:48:55. Near east coast of Kamchatka.
17	(W)Z,Z	e	15 47 30		
17	(W)Z,Z (W)EN Z (M)E	eP iS eP'P' M	18 46 27 55 31 19 14 51 19.3		USCGS: H - 18:35:27. Depth: about 60 km. 52 <sup>o</sup> N., 159 <sup>1</sup> / <sub>2</sub> <sup>o</sup> E. Off South coast of Kamchatka. Mag: 6 <sup>3</sup> / <sub>4</sub> (Pas).
17	(W)Z	ePKP	22 55 38		USCGS: H - 22:35:50. San Juan province, Argentina.
17	(W)Z,Z	iP	23 30 24		Dilatation. USCGS: H - 23:20:33. Depth: about 350 km. 28 <sup>o</sup> N., 140 <sup>o</sup> E. Bonin Islands region.
18	(W)Z,Z	e	00 14 59		
18	(W)Z,Z (W)Z	e e	05 07 24 09 34		
18	Z (L)N	eP e(S)	08 56 58 09 04 02		USCGS: H - 08:47:58. About 150 miles off north coast of Formosa.
18	(W)Z,Z	e	15 38 14		
18	(W)Z,Z	e	16 24 31		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
18	(W)Z,Z (W)N (L)N (M)E	eP iS eS M	19 19 12 21 29 35 25.3	12 <sup>o</sup> .1 1345	H - 19:16:15. USCGS: H - 19:16:07. 28 <sup>o</sup> N., 52 <sup>1</sup> / <sub>2</sub> <sup>o</sup> E. Southern Iran.
18	(W)Z	e	22 41 29		
19	(W)Z	ePKP	01 25 16		USCGS: H - 01:06:06. 26 <sup>o</sup> S., 74 <sup>1</sup> / <sub>2</sub> <sup>o</sup> W. Off coast of Northern Chile.
19	(W)Z,Z (L)N	eP e(S)	04 45 09 50 01		
19	(W)Z	eP	07 38 23		USCGS: H - 07:28:04. Celebes Sea.
19	(W)Z	e	08 09 17		
19	(W)Z	e	16 41 20		
19	(W)Z (L)E, (M)E (M)E, (L)E (L)E (M)E	eP ePP iS iSS M	16 54 32 55 56 17 00 18 03 04 11.9	37 <sup>o</sup> .0 4110	H - 16:47:19. USCGS: H - 16:47:17. 39 <sup>1</sup> / <sub>2</sub> <sup>o</sup> N., 23 <sup>o</sup> E. Near east coast of Greece. Many killed and extensive property damage at Volos.
19	(W)Z	e	18 09 57		
19	(W)Z,Z Z,E E (L)N (M)E (M)E	iPKP iPKS eSKS iPoPP' iSS M	20 43 41 47 10 50 45 51 57 21 05 02 52.2		Dilatation. USCGS: H - 20:24:05. 30 <sup>o</sup> S., 72 <sup>o</sup> W. Near coast of Central Chile. Extensive damage from water waves at Tongoy and La Serena. Mag: 7 (Pas).
19	(W)Z	e	20 57 31		
19	(W)Z	e	21 02 44		
19	(W)Z	e	21 09 01		
19	(W)Z	e	21 26 20		
19	(W)Z	e	21 41 13		
20	(W)Z	i	01 28 19		Dilatation.
20	(W)Z,Z (M)E (L)E	ePKP ePKS iSKKS	02 32 07 35 45 42 25		USCGS: H - 02:12:26. 30 <sup>1</sup> / <sub>2</sub> <sup>o</sup> S., 72 <sup>1</sup> / <sub>2</sub> <sup>o</sup> W. Near coast of Central Chile. Felt. Mag: 6 <sup>1</sup> / <sub>2</sub> (Pas).
20	(W)Z,Z (L)E	ePKP i	06 08 10 11 57		USCGS: H - 05:48:27. 30 <sup>1</sup> / <sub>2</sub> <sup>o</sup> S., 72 <sup>1</sup> / <sub>2</sub> <sup>o</sup> W. Near coast of Central Chile. Felt. Mag: 6 <sup>1</sup> / <sub>2</sub> (Pas).



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
20	(W)Z	e	06 37 03		
20	(W)Z,Z N N EN	eP i i eS	08 18 03 55 19 39 21 40	19 <sup>o</sup> .7 2190	H - 08:13:29. USCGS: H - 08:13:35. 44 $\frac{1}{2}$ <sup>o</sup> N., 83 $\frac{1}{2}$ <sup>o</sup> E. Sinkiang province, China.
20	(W)Z,Z	eP	09 54 41		USCGS: H - 09:44:07. 1 <sup>o</sup> N., 126 <sup>o</sup> E. Molucca Passage.
21	(W)Z,Z Z (L)N (L)N (L)N	iP ePP eS iSS M	07 25 30 26 59 31 18 34 08 40.0	37 <sup>o</sup> .3 4145	Dilatation. H - 07:18:16. USCGS: H - 07:18:17. 39 $\frac{1}{2}$ <sup>o</sup> N., 23 <sup>o</sup> E. Near east coast of Greece. Many casualties and extensive property damage.
21	(W)Z,Z	ePKP	14 18 22		USCGS: H - 13:58:46. Chile aftershock.
22	(W)Z,Z Z (L)NE,NE N (L)E	eP ePcP eS e M	01 22 49 24 17 29 44 31 07 02 06.1	47 <sup>o</sup> .5 5280	Dilatation. H - 01:14:10.
22	(W)Z	e	02 57 56		
22	Z	eP	10 09 33		USCGS: H - 10:02:21. 34 $\frac{1}{2}$ <sup>o</sup> N., 24 $\frac{1}{2}$ <sup>o</sup> E. Off south coast of Crete.
22	(W)Z,Z Z (L)N N	iP ipP iS e	16 38 05 22 46 35 47 49	64 <sup>o</sup> .6 7175	Compression. H - 16:27:36. Depth: about 100 km. USCGS: H - 16:27:31. Depth: about 100 km. 46 <sup>o</sup> N., 150 $\frac{1}{2}$ <sup>o</sup> E. Kurile Islands.
23	(W)Z (W)N	iP iS	01 05 05 06 33		
23	Z	e	02 41 36		
23	(W)Z,Z Z	ePKP ePKS	04 17 40 21 04		USCGS: H - 03:58:03. Chile aftershock.
23	(W)Z,Z E (L)EN	iP i eS	16 48 46 59 56 36		Dilatation. USCGS: H - 16:39:04. Depth: about 500 km. 27 $\frac{1}{2}$ <sup>o</sup> N., 139 $\frac{1}{2}$ <sup>o</sup> E. Kurile Islands. Bonin Islands region.
23	Z	ePKP <sub>2</sub>	18 49 03		USCGS: H - 18:28:47. 24 $\frac{1}{2}$ <sup>o</sup> S., 113 <sup>o</sup> W. Easter Islands region. Mag: 6 $\frac{3}{4}$ (Pas).



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
23	(W)Z,Z	e	19 59 18		
23	(W)Z,Z	ePKP	20 00 59		USCGS: H - 19:41:20. Chile aftershock.
24	(W)Z,Z (L)E,E (L)NE	eP iS L	13 03 36 07 11 10.1	19 <sup>o</sup> .6 2180	H - 12:59:04. USCGS: H - 12:59:00. 45 <sup>o</sup> N., 86 <sup>o</sup> E. Sinkiang province, China.
24	(W)Z,Z Z	eP eS	14 16 11 19 53	20 <sup>o</sup> .2 2245	H - 14:11:32. USCGS: H - 14:11:42. 44 <sup>o</sup> N., 83 <sup>1</sup> / <sub>2</sub> E. Sinkiang province, China.
24	Z, (W)N	eP	22 56 38		
25	(W)Z,Z (W)Z,Z	e e	09 00 33 44		USCGS: H - 08:49:50. 44 <sup>1</sup> / <sub>2</sub> N., 149 <sup>1</sup> / <sub>2</sub> E. Kurile Islands.
25	(W)Z,Z (W)N,E	eP e(S)	10 29 54 31 51		
26	(W)Z,Z (L)E (L)E	eP eS eL	01 21 50 25 27 27.9	19 <sup>o</sup> .7 2190	H - 01:17:17.
26	(W)Z,Z (L)E (L)E	eP iS M	01 41 36 45 14 48.8	19 <sup>o</sup> .8 2200	H - 01:37:01.
26	(W)Z,Z	e	01 51 55		
26	(W)Z,Z (W)Z	ePKP ePKS	03 22 47 26 10		USCGS: H - 03:03:34. Depth: about 60 km. 13 <sup>1</sup> / <sub>2</sub> N., 89 <sup>1</sup> / <sub>2</sub> W. Near coast of El Salvador. Felt: San Salvador. Mag: 6 <sup>1</sup> / <sub>2</sub> (Pas).
26	(W)Z	e	08 49 23		
26	(W)Z	e	09 16 53		
26	(W)Z,Z (W)E	iP eS	23 14 19 15 39	6 <sup>o</sup> .9 765	H - 23:12:34.
27	(W)E,Z Z	eP e(S)	11 52 22 54 12		
27	(W)E,Z Z	eP e(S)	13 32 23 34 12		
27	(W)E	e	15 40 12		
27	(W)Z (W)E (L)N	eP eS M	22 46 27 50 03 54.7	19 <sup>o</sup> .7 2190	H - 22:41:54. USCGS: H - 22:42:00. Sinkiang province, China.



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
28	(W)Z	ePKP	00 55 49		USCGS: H - 00:35:49. 8 $\frac{1}{2}$ <sup>o</sup> S., 108 <sup>o</sup> W. Pacific Ocean. Mag: 6 (Pas).
28	(W)Z,Z	e	05 56 46		
28	(W)Z,Z (L)N (M)E	iP eS M	19 17 17 27 21 57.2	80 <sup>o</sup> .0 8890	Compression. H - 19:05:04. USCGS: H - 19:04:59. 51 <sup>o</sup> N., 178 $\frac{1}{2}$ <sup>o</sup> W. Felt: Adak. Mag: 6 $\frac{1}{2}$ (Pas).
29	(W)E (W)E	eP e	07 38 35 39 36		
29	Z N (L)E	eP iS M	11 55 22 57 04 59.5	8 <sup>o</sup> .9 990	H - 11:53:09.
29	(W)E	e	19 29 06		
29	(W)E	e	20 29 07		
29	(W)E,Z N	eP eS	23 27 52 29 35	9 <sup>o</sup> .0 1000	H - 23:25:38.
30	(W)E	e	09 23 07		
30	(W)Z (L)N (L)E	eP eS M	14 15 28 23 52 46.7	62 <sup>o</sup> .0 6890	H - 14:05:04. USCGS: H - 14:05:10. 40 $\frac{1}{2}$ <sup>o</sup> N., 143 <sup>o</sup> E. Honshu foreshock.
30	(W)Z	e	17 51 12		

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QUETTA OBSERVATORY

May, 1955.

DATE	COMP.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
PAKISTAN METEOROLOGICAL SERVICE					
1	(W)2	e	05 58 12		
1	(W)E,2	1P	10 05 59	62° .0	Compression.
		1	Director: S. N. NAQVI		
		1PP	07 58		
	(L)N	1S	14 03		
	1	1SoS	15 24		
	(O)E	M	57.0		
1	(W)2,2	eP	14 09 08	62° .0	
	2	e	14	6890	USGS: H - 14:09:44.
	3	ePPeP	40		(misprinted as 14:58:44)
	(L)N	1S	17 29		30° N., 143° E.
	(L)N	1SoS	18 58		Honshu aftershock.
	(O)E	M	40.8		Magn: 6 (Pan.)
1	(W)2,2	eP	21 29 36		USGS: H - 21:22:40.
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2	(W)3	eP	12 50 22		USGS: H - 12:29:58.
					19° N., 145° E.
					Marianas Islands region.
2	(W)2,2	1P	14 41 09	11° .4	Dilatation.
	(W)2E	eS	43 18	3270	H - 14:58:22.
3	(O)E	e	18 04 38		
3	(W)2,2	1P	17 17 35	62° .2	Compression.
	1	1PP	20 01	6910	H - 17:07:27.
	1	ePPP	21 40		USGS: H - 17:07:35.
	1,2	eS	28 18		59° N., 143° E.
	2	eSoS	27 44		Near coast of Northern
	(O)E	M	47.2		Honshu, Japan.
3	(O)E	eP	Part I. Seismology		
3	(W)2,2	eP	No. 26, 28	28° .6	H - 00:18:58.
	(L)N	1S	27 12	2950	USGS: H - 00:18:59.
	(O)E	M	55.8		28° N., 96° E.
					Northern Assam.
4	(O)2,2	eP	08 25 27		
4	(W)E,2	1P	10 07 21	8° .1	Dilatation.
	(O)E,2	eS	08 54	900	H - 10:05:20.
4	(O)2	eP	15 15 34		
Seismological Bulletin					
4	(W)2,2	eP	15 27 41	27° .3	H - 15:21:59.
	(L)E	eS	May 1955		3050
	(L)N	M	57.0		
5	(O)2,2	ePPeP	08 07 27		USGS: H - 08:48:50.
					57° S., 179° W.
					Kermadec Islands region.





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## QUETTA OBSERVATORY

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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
1	(W)Z	e	03 56 12		
1	(W)E,Z E Z (L)N N (M)E	iP i iPP iS iScS M	10 05 39 58 07 56 14 03 15 24 37.0	62° .0 6890	Compression. H - 09:55:15. USCGS: H - 09:55:16. 39½° N., 143½° E. Off coast of Northern Honshu, Japan. Mag: 6¾ (Pas.)
1	(W)Z,Z Z Z (L)N (L)N (M)E	eP e ePcP iS iScS M	14 09 05 14 46 17 29 18 55 40.3	62° .0 6890	H - 13:58:41. USCGS: H - 13:58:44. (misprinted as 14:58:44) 39½° N., 143½° E. Honshu aftershock. Mag: 6 (Pas.)
1	(W)Z,Z	eP	21 29 36		USCGS: H - 21:22:40. 45½° N., 27° E. East Central Romania.
2	(W)Z	eP	12 50 22		USCGS: H - 12:38:56. 19° N., 145° E. Marianas Islands region.
2	(W)Z,Z (W)ZE	iP eS	14 41 09 43 18	11° .4 4270	Dilatation. H - 14:38:22.
3	(W)E	e	12 04 35		
3	(W)Z,Z N N N,E N (L)E	iP iPP ePPP eS eScS M	17 17 53 20 01 21 40 26 18 27 44 47.0	62° .2 6910	Compression. H - 17:07:27. USCGS: H - 17:07:33. 39½° N., 143° E. Near coast of Northern Honshu, Japan.
3	(W)E	eP	17 57 14		
4	(W)Z,Z (L)N (L)E	eP iS M	00 22 38 27 12 35.8	26° .6 2950	H - 00:16:56. USCGS: H - 00:16:59. 28° N., 96½° E. Northern Assam.
4	(W)Z,Z	eP	06 25 27		
4	(W)E,Z (W)E,E	iP eS	10 07 21 08 54	8° .1 900	Dilatation. H - 10:05:20.
4	(W)Z	eP	15 15 34		
4	(W)Z,Z (L)E (L)N	eP eS M	15 27 41 32 20 37.0	27° .3 3030	H - 15:21:59. Near coast of Northern Honshu, Japan.
5	(W)Z,Z	ePKP	06 07 27		USCGS: H - 05:48:30. 33° S., 179½° W. Kermadec Islands region.



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
5	(W)E	eP	08 57 03		USCGS: H - 08:44:12. New Britain.
6	(W)Z,Z	iP	00 14 53	61 <sup>o</sup> .4	Compression.
	N	ePcP	15 33	6820	H - 00:04:33.
	N	ePP	17 15		USCGS: H - 00:04:31.
	Z	ePPP	18 37		40 <sup>o</sup> N., 143 <sup>o</sup> E.
	(L)EN	eS	23 13		Near coast of Northern
	N	eScS	24 43		Honshu, Japan.
	(L)N	M	44.5		
6	(W)Z	eP	04 57 35	7 <sup>o</sup> .3	H - 04:55:45.
	(W)E,N	iS	59 00	810	
6	(W)Z,Z	eP	08 01 33.6	2 <sup>o</sup> .4	H - 08:00:53.
	(W)E	iS	02 04.5	270	
	(L)E	iL	33.0		
6	Z	eP	11 52 23	155 <sup>o</sup> .5	USCGS: H - 11:39:53. 35 <sup>1</sup> / <sub>2</sub> <sup>o</sup> N., 36 <sup>o</sup> W. North Atlantic Ocean.
6	(W)Z	eP	14 00 59		
6	(W)Z,Z	iP	16 47 59		Dilatation. USCGS: H - 16:35:57. Depth: about 100 km. 51 <sup>o</sup> N., 180.
	(L)E	M	12 31.1		Andreanof Islands, Aleutian Islands.
7	(W)Z,Z	eP	03 23 36	7 <sup>o</sup> .5	H - 03:21:43.
	(W)E,E	eS	10 25 03	830	
7	(W)Z	iP	22 45 57.4	2 <sup>o</sup> .4	Dilatation.
	(L)N	iS	17 46 27.7	270	H - 22:45:16. out of Luzon Island, Philippine Islands.
8	(W)E	e	04 21 10		
8	(W)Z	eP	04 46 45	11 <sup>o</sup> .2	USCGS: H - 04:39:47. Crete.
	(L)E	eS	02 38	1240	
8	(W)Z	eP	13 44 58	65 <sup>o</sup> .3	Dilatation.
	(L)E	iP	24 07	7250	H - 13:24:00.
8	(W)Z,Z	eP	18 44 16		Depth: about 700 km.
	N	eP	38 56		USCGS: H - 19:25:58.
	(L)E	M	19 12.5		Depth: about 700 km.
8	(W)Z,Z	eP	21 48 27		USCGS: H - 21:39:26.
	(L)N	M	22 16.5		40 <sup>1</sup> / <sub>2</sub> <sup>o</sup> N., 1 <sup>1</sup> / <sub>2</sub> <sup>o</sup> W. Eastern Spain.
8	(L)E	eP	21 43 05		
9	(W)E	eP	09 00 55		
9	(W)Z,Z	iP	20 25 38		Dilatation.
	(L)E	e	15 52 32		USCGS: H - 20:15:10. 41 <sup>o</sup> N., 145 <sup>o</sup> E.
12	(W)E	e	20 03 15		Near coast of Northern Honshu, Japan.
15	(L)E	ePcP	03 49 07		USCGS: H - 03:29:55.
10	(W)Z	eP	03 17 08	6 <sup>o</sup> .5	H - 03:15:29.
	(W)E	eS	18 24	720	Virgin Islands region.



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
10	(W)Z,Z	iP	04 41 07	770	H - 11:40:53. Compression.
10	(W)E	e	07 53 33		Dilatation.
10	(W)Z,Z	eP	08 22 40	11 <sup>o</sup> .5	H - 25:56:28.
10	(W)E	e	11 36 32	1280	
10	(W)E	e	23 25 54	7 <sup>o</sup> .2	H - 03:51:15.
11	(W)Z,Z (L)EN,N	eP iS	00 20 11.7 43.1	2 <sup>o</sup> .5 280	H - 00:19:29. H - 08:04:17. Depth: about 500 km.
11	(W)Z,Z	eP	00 54 48		USCGS: H - 00:43:36. 8 <sup>o</sup> S., 128 <sup>o</sup> E. Timor Island region.
11	(W)Z,Z E Z (L)NE (L)E (L)E (L)E (L)N (L)E	ePKP ePP ePKS eSKS eSKKS ePPS eSS eSSS M	11 23 23 26 08 30 38 32 56 38 07 43 56 49 02 12 31.1	135 <sup>o</sup> .5 15050	USCGS: H - 11:04:00. 0, 78 <sup>o</sup> W. Ecuador. Mag: 6 $\frac{3}{4}$ (Pas.) H - 11:04:01. H - 13:35:42. Palt Risalpur, Rawalpindi and Peshawar. USCGS: H - 15:55:58. Depth: about 300 km.
11	(W)Z,Z	eP	15 59 11		USCGS: H - 15:48:57. 36 <sup>o</sup> N., 140 $\frac{1}{2}$ <sup>o</sup> E. Near East Coast of Honshu, Japan.
11	(W)Z,Z (L)E (L)E (L)E	eP eS eSS M	16 46 06 53 15 56 46 17 11.0	49 <sup>o</sup> .7 5520	H - 16:37:10. USCGS: H - 16:37:10. 19 $\frac{1}{2}$ <sup>o</sup> N., 121 $\frac{1}{2}$ <sup>o</sup> E. Off North Coast of Luzon Island, Philippine Islands.
11	(W)Z (W)E	eP eS	19 00 31 02 38	11 <sup>o</sup> .2 1240	H - 18:57:47.
11	(W)Z,Z (W)Z Z Z	iP i epP ePP	19 33 41 34 07 35 48 36 35	65 <sup>o</sup> .3 7250	Dilatation. H - 19:24:00. Depth: about 700 km. USCGS: H - 19:23:58.
11	N Z	eS eP'P'	03 41 35 20 02 17		Depth: about 700 km. 7 <sup>o</sup> S., 123 $\frac{1}{2}$ <sup>o</sup> E. Banda Sea.
11	(W)E	e	21 43 06		
12	(W)Z,Z (W)E (L)N	eP i	00 51 56 52 08	2 <sup>o</sup> .0 380	H - 05:03:28.
12	(W)Z	e	16 32 32		USCGS: H - 14:07:45. 66 <sup>o</sup> N., 153 <sup>o</sup> W.
12	(W)E	e	20 03 13		Off South Coast of Alaska Peninsula.
13	Z (L)N	ePKP M	03 49 07 04 54.1		USCGS: H - 03:29:55. 19 $\frac{1}{2}$ <sup>o</sup> N., 64 <sup>o</sup> W. Virgin Islands region.



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DATE	COMPT.	PHASE	GMT	$\Delta$	REMARKS
DATE	COMPT.	PHASE	h. m. s.	km.	REMARKS
13	(W)E	eP	11 42 38	6 <sup>o</sup> .9	H - 11:40:53.
17	(W)E	eS	14 43 58	770	Compression.
13	(W)Z,Z	iP	13 25 16		Dilatation.
13	(W)Z	eP	23 59 16	11 <sup>o</sup> .5	H - 23:56:28.
	(W)E	eS	00 01 26	1280	Mag: 7 (Pas.)
14	(W)Z,Z	eP	03 53 04	7 <sup>o</sup> .2	H - 03:51:15.
	(L)N	iS	54 27	800	
14	(W)Z,Z	iP	06 13 55	62 <sup>o</sup> .5	Dilatation.
	E	i	14 09	6900	H - 06:04:17.
	Z	iPcP	25		Depth: about 500 km.
	(L)N	epP	01 15 41	11 <sup>o</sup> .3	USCGS: H - 06:04:14.
	N	iPP	16 37	1280	Depth: about 500 km.
	N	iS	21 44		28 <sup>o</sup> N., 139 $\frac{1}{2}$ <sup>o</sup> E.
	(L)N	iScS	05 22 58		Bonin Islands region.
	(L)N	isS	24 39		Mag: 6 $\frac{3}{4}$ (Pas.)
	(L)N	eSS	26 03		East Coast of Formosa.
	(W)Z	eP'P'	42 25		
14	(W)Z,N	iP	13 37 27	6 <sup>o</sup> .9	Dilatational.
	(W)N	i	56 37	770	H - 13:35:42.
	(L)N,E	i	44		Felt Risalpur, Rawalpindi and Peshawar.
	(L)E	i	07 31 59	48 <sup>o</sup> .3	USCGS: H - 13:35:38.
	(L)N	iS	38 47	5480	Depth: about 200 km.
18	(W)E	eP	12 03 (32)		37 <sup>o</sup> N., 71 $\frac{1}{2}$ <sup>o</sup> E.
					Hindu Kush.
14	(W)Z	eP	19 54 13	11 <sup>o</sup> .0	H - 19:51:31.
	(W)E	iS	56 18	1220	5 <sup>o</sup> S., 150 <sup>o</sup> E.
					New Britain.
14	(W)Z	e	20 18 55		USCGS: H - 20:00:00.
	(W)E	eP	02 20 37		29 <sup>o</sup> N., 126 $\frac{1}{2}$ <sup>o</sup> W.
					Pacific Ocean. Off Coast of Lower California.
19	(W)E,Z	iP	03 40 41	7 <sup>o</sup> .4	
	E	eS	42 07	820	
15	E	eP	07 49 52		USCGS: H - 07:07:13.
	N	ePRP	07 50 04		Depth: about 100 km.
15	E	e	08 20 23		19 <sup>o</sup> S., 93 <sup>o</sup> W.
					Northern Chile.
15	E	eP	18 08 18	7 <sup>o</sup> .8	H - 18:06:21.
	N,E	eS	13 09 48	870	H - 18:00:31.
	(W)E	iS	23 56	650	
16	E	e	03 45 07		USCGS: H - 03:34:30.
	(W)Z	eP	22 38 57		About 300 kilometres south of Honshu, Japan.
20	(W)Z,Z	iP	12 21 33		Compression.
17	(W)E,Z	e	02 48 49		
20	(W)Z,Z	eP	14 25 47		
17	(W)E,Z	eP	05 04 18.0	3 <sup>o</sup> .0	H - 05:03:28.
	(W)E,(L)N	iS	01 40 55.5	330	H - 01:30:04.
		ePcP	41 08	7080	USCGS: H - 01:30:15.
17	(W)E,Z	eP	14 20 32		USCGS: H - 14:07:43.
	(L)N	iScS	50 36		56 <sup>o</sup> N., 156 $\frac{1}{2}$ <sup>o</sup> W. west of Alaska.
	(L)E	M	02 11.4		Off South Coast of Alaska Peninsula.
21	(W)Z,Z	eP	01 45 48		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
17	(W)E,Z E,Z (M)E,(W)E, E,N (M)E	iP iPPP iS M	14 56 41 58 15 02 11 11.7	34 <sup>o</sup> .7 3850	Compression. H - 14:49:47. USCGS: H - 14:49:47. 7 <sup>o</sup> N., 94 $\frac{1}{2}$ <sup>o</sup> E. Nicobar Islands. Mag: 7 (Pas.)
17	(W)E,Z	eP	16 15 09		
17	(W)E,Z	eP	19 15 21		
17	(W)E,Z	eP	21 32 38		
18	(W)E (W)E	eP eS	01 00 23 02 31	11 <sup>o</sup> .3 1250	H - 00:57:37.
18	(W)E,E E (L)N (L)N (M)E (L)N (L)N	eP ePPP e e eScS eSS M	05 35 02 37 46 41 58 42 19 44 56 45 53 56.8		USCGS: H - 05:26:14. 23 <sup>o</sup> N., 121 $\frac{1}{2}$ <sup>o</sup> E. Near Coast of Formosa.
18	(W)E (L)N	eP eS	07 31 49 38 55	49 <sup>o</sup> .3 5480	H - 07:22:57. USCGS: H - 07:23:00. Formosa aftershock.
18	(W)E	eP	12 03(32)		
18	(W)E	eP	15 58 49		USCGS: H - 15:46:04. 5 <sup>o</sup> S., 150 <sup>o</sup> E. New Britain.
19	(W)E	eP	02 20 37		
19	(W)E,E E	iP eS	03 40 41 42 07	7 <sup>o</sup> .4 820	H - 03:38:49.
19	N	epPKP	07 27 07		USCGS: H - 07:07:13. Depth: about 100 km. 19 <sup>o</sup> S., 69 <sup>o</sup> W. Northern Chile.
19	(W)Z (W)E	iP iS	19 32 36 33 56	6 <sup>o</sup> .9 650	H - 19:30:51.
19	(W)Z	eP	22 38 57		
20	(W)Z,Z	iP	12 21 23		Compression.
20	(W)Z,Z	eP	14 25 47		
21	(W)Z,Z Z (L)N (L)N (L)E	eP ePcP iS iScS M	01 40 40 41 08 49 14 50 36 02 11.4	63 <sup>o</sup> .7 7080	H - 01:30:04. USCGS: H - 01:30:15. 29 <sup>o</sup> N., 140 <sup>o</sup> E. Bonin Islands foreshock.
21	(W)Z,Z	eP	01 45 48		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
21	(W)Z,Z	eP	03 40 33	63 <sup>o</sup> .5	H - 03:29:59.
	E	ePcS	45 11	7050	USCGS: H - 03:30:06.
	(L)E	iS	49 06		29 <sup>o</sup> N., 140 $\frac{1}{2}$ <sup>o</sup> E.
	(L)N	iScS	50 28		Bonin Islands region.
	(L)N,(L)E	iSS	53 13		
	(L)E	M	04 11.4		
21	(W)Z,Z	eP	04 17 13		
21	(W)Z	eP	04 20 02		
21	(W)Z,Z	eP	04 57 07		
21	(W)Z,Z	eP	05 37 10		
21	(W)Z,Z	eP	08 57 51	12 <sup>o</sup> .6	H - 08:54:48.
	(W)E,E	eS	09 00 13	1400	
21	(W)Z,Z	e	12 25 18		
21	(W)Z,Z	iP	15 37 36		Dilatation.
	(W)Z	i	49		USCGS: H - 15:27:10.
	(L)N	e	45 49		Eastern Java.
	(L)N	eSS	49 51		
21	(W)Z,Z	eP	15 48 16		
21	(W)Z,Z	ePKP	15 58 19		USCGS: H - 15:39:24.
	(W)Z,Z	e	16 00 22		Depth: about 100 km. 15 $\frac{1}{2}$ <sup>o</sup> S., 173 <sup>o</sup> W. Samoa Islands.
21	(W)Z	eP	23 03 34		
22	(W)Z,Z	eP	14 17 09	73 <sup>o</sup> .4	H - 14:05:33.
	(L)N	iS	26 38	8150	USCGS: H - 14:05:35. 18 <sup>o</sup> N., 147 $\frac{1}{2}$ <sup>o</sup> E. Marianas Islands.
22	(W)Z,Z	iP	14 54 21	6 <sup>o</sup> .7	Compression.
	(W)E	iS	55 39	740	H - 14:52:39.
22	(W)Z,Z	eP	17 40 03	2 <sup>o</sup> .3	H - 17:39:23.
	(W)N	iS	32	250	
22	(W)Z,Z	eP	19 56 26	6 <sup>o</sup> .3	H - 19:54:50.
	(W)E	iS	57 40	700	
22	(W)E	e	21 26 40		
23	(W)Z,Z	e	00 04 37		USCGS: H - 23:45:17.
	Z	e	58		Depth: about 100 km.
	(W)Z	e	05 07		11 <sup>o</sup> S., 74 <sup>o</sup> W. Central Peru.
23	(W)Z	eP	04 36 04		
23	(W)Z,Z	iP	06 09 53		Dilatation.
23	(W)Z,Z	iP	16 41 35		Compression. USCGS: H - 16:32:38. Near East Coast of Formosa.







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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
28	(W)E (L)N	eP iS	19 30 19.5 31 23.3	5 <sup>o</sup> .4 600	H - 19:28:56.
29	(W)Z (W)E	eP iS	00 59 24 01 01 34	11 <sup>o</sup> .5 1280	H - 00:56:36.
29	(W)Z,Z	iPKP	01 32 52		Dilatation. USCGS: H - 01:15:07. Depth: about 600 km. 24 <sup>o</sup> S., 177 <sup>1</sup> / <sub>2</sub> <sup>o</sup> E. South of Fiji Islands.
29	(W)Z,Z Z (W)Z	iP epP ePP	02 41 28 42 48 43 50		Dilatation. USCGS: H - 02:31:34. Depth: about 400 km. 50 <sup>o</sup> N., 151 <sup>o</sup> E. Sea of Okhotsk.
29	(W)Z,Z Z	eP e	04 12 28 14 36		USCGS: H - 03:59:05. Bouvet Island region.
29	(W)Z,Z (L)E (L)N	eP eL M	11 16 51 34.0 47.5		USCGS: H - 11:05:50. 49 <sup>o</sup> N., 157 <sup>o</sup> E. Northern Kurile Islands.
29	(W)Z,Z Z (L)N,E (L)N (L)N (L)N (L)N (L)E (L)E	eP ePP iSKS iS eScS ePS eSS e M	13 44 16 47 39 54 44 57 55 13 56 00 14 00 42 03 27 22.2	87 <sup>o</sup> .6 9730	H - 13:31:25. USCGS: H - 13:31:26. 56 <sup>o</sup> N., 155 <sup>o</sup> W. Near South Coast of Kodiak Island. Mag: 5 <sup>3</sup> / <sub>4</sub> (Pas.)
29	Z E (L)E E Z	eP i iPcS eS eP'P'	15 43 57 44 32 48 49 51 56 16 13 42	57 <sup>o</sup> .9 6430	H - 15:34:01. USCGS: H - 15:34:00. 10 <sup>1</sup> / <sub>2</sub> <sup>o</sup> S., 110 <sup>1</sup> / <sub>2</sub> <sup>o</sup> E. Off South Coast of Java. Mag: 6 <sup>3</sup> / <sub>4</sub> (Pas.)
29	(W)Z (W)E	eP iS	17 34 37.8 35 34.6	4 <sup>o</sup> .8 530	H - 17:33:23.
29	(W)Z Z (L)N (L)N (L)N (L)N (L)N (M)E	eP ePP iSKS eS eScS e ePS M	21 16 00 19 28 26 28 41 55 27 14 44 53.8	87 <sup>o</sup> .4 9710	H - 21:03:10. USCGS: H - 21:03:07. 56 <sup>o</sup> N., 155 <sup>o</sup> W. Kodiak Island aftershock. Mag: 5 <sup>1</sup> / <sub>2</sub> (Pas.)
30	(W)Z	e	03 07 18		
30	(W)Z,Z (W)N Z (M)E (L)N,(W)N,N (M)E (M)E,(L)N	iP iPcP iP iPPP iS iS iScS	12 41 38 57 43 31 46 05 49 44 53 15 50 39	67 <sup>o</sup> .0 7440	Dilatation. H - 12:31:42. Depth: about 600 km. USCGS: H - 12:31:41. Depth: about 600 km. 24 <sup>1</sup> / <sub>2</sub> <sup>o</sup> N., 142 <sup>1</sup> / <sub>2</sub> <sup>o</sup> E. Volcano Islands. Mag: 7 <sup>1</sup> / <sub>4</sub> (Pas.)



Contd. ....

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DATE	COMPT.	PHASE	GMT		$\Delta$ km.	REMARKS
			h.	m. s.		
30	(L)N	iSS	12	54 19	67°.0	Short period activity superimposed on the waves after about 15 minutes of P 12 41 38, and continued for about half an hour. Probably aftershocks! Some local activity is also superimposed.
	(M)E	iSSS		57 27	7440	
	(M)E	M	13	12.1		
30	(W)Z	e	13	09 18		Dilatation. USCGS: H - 16:54:57. Depth: about 550 km. 17° S., 178½° W. Fiji Islands.
	Z	i		24		
	Z	i		10 06		
	E	e		17 46		
30	(W)Z,Z	e	13	28 15		
30	(W)Z,Z	eP	13	42 39		
30	(W)Z,Z	iPKP	17	12 49		
30	(W)Z,Z	eP	18	09 35	15°.0	H - 18:06:00.
	(L)N	iS		12 23	1670	
30	(W)Z,Z	eP	22	07 53	7°.4	H - 22:06:01.
	(W)E	eS		09 19	820	
30	Z	iP	23	38 33	74°.0	Compression. H - 23:26:54. USCGS: H - 23:26:50. 3° S., 137° E. Western New Guinea. Mag: 6½ (Pas.)
	Z	iPcP		52	8220	
	Z	iPP		41 20		
	(L)E	i		47 54		
	(L)N,N	iS		48 05		
	(L)E	iScS		47		
	(L)E	eSS		52 33		
	(L)E	M		00 06.1		
31	(W)Z	eP	01	11 44	5°.6	H - 01:10:17.
	(W)Z,E	eS		12 50	620	
31	(W)Z,Z	eP	07	32 35		USCGS: H - 07:22:30. Depth: about 100 km. Near East Coast of Honshu, Japan.
31	(W)Z,Z	ePKP	09	49 38		USCGS: H - 09:30:44. Depth: about 100 km. 27° S., 177½° W. Kermedec Islands region. Mag: 6¾ (Pas.) (Gutenberg tables used).
	(W)Z	i		50 22		
	(W)Z,Z	i		42		
	E	ePP		51 30		
	Z	epPP		51		
	(L)E	eSKS		56 31		
	(L)N	eSP		10 00 24		
31	(W)Z,Z	iP	14	54 07	60°.0	Dilatation. H - 14:44:08. Depth: about 100 km. USCGS: H - 14:44:10. Depth: about 100 km. 42° N., 141° E. Near South Coast of Hokkaido, Japan.
	(W)E	ipP		40	6670	
	(L)EN,N,E	iS	15	02 10		
	(L)N	esS		54		
	(L)EN	iScS		03 45		



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31	(W)Z	eP	14 54 12	59 <sup>o</sup> .5	H - 14:44:05. USCGS: H - 14:44:06. 43 <sup>o</sup> N., 141 <sup>o</sup> E. Near West Coast of Hokkaido, Japan.
	(L)N	iS	15 02 21	6610	
31	(W)Z	iP	16 42 23	79 <sup>o</sup> .1	Compression. H - 16:30:15. USCGS: H - 16:30:18. Bismarck Sea.
	E	i	41	8790	
	Z	e	44 29		
	(L)E	e	45 05		
	(L)N	iS	52 22		
31	(W)Z,Z	ePKP	18 16 48	143 <sup>o</sup> .1	H - 17:57:12. USCGS: H - 17:57:12. 0 <sup>o</sup> , 92 <sup>o</sup> W. Galapagos Islands.
	(L)E	i	19 00	15900	
	Z	ePP	20 03		
	(L)N	iPKS	33		
	(L)E	e	25 00		
	(L)E	e	28 29		
	(L)N	e	30 21		
	(L)N	e	32 57		
	(L)N	eSS	38 39		
	(L)E	M	19 30.0		
31	(W)Z,Z	eP	18 31 56		

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PAKISTAN METEOROLOGICAL SERVICE

Director: S. N. NAQVI



GEOPHYSICAL REVIEW

Vol. I. 1955

Part I. Seismology

No. 7.

Seismological Bulletin

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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
1	(W)Z,Z Z (L)E	eP e M	15 34 23 34 56.0		USCGS: H - 15:25:32. 24 $\frac{1}{2}$ $^{\circ}$ N., 122 $\frac{1}{2}$ $^{\circ}$ E. Near east coast of Formosa.
1	(W)Z (W)Z E,N E E,N N (L)N Z	iP ipP eS e esS e e eP'P'	16 21 06 29 29 37 52 30 24 31 07 37 08 50 08	64 $^{\circ}$ .7 7200	Compression. H - 16:10:36. Depth: about 100 km. USCGS: H - 16:10:32. Depth: about 100 km. 1 $\frac{1}{2}$ $^{\circ}$ N., 128 $^{\circ}$ E. Halmahera.
1	(W)Z	e	17 07 22		
2	(W)Z,Z Z Z (L)N (M)E (M)E (L)E (M)E Z (M)E	iP i iPP iS eScS ePS i eSS eP'P' M	00 31 09 11 34 10 41 11 32 47 42 26 46 19 57 50 01 09.8	79 $^{\circ}$ .6 8840	Compression. H - 00:18:59. USCGS: H - 00:18:56. 51 $\frac{1}{2}$ $^{\circ}$ N., 180. Andreanof Islands, Aleutian Islands. Mag: 6 $\frac{3}{4}$ (Pas.)
2	(W)Z,Z	iP	00 35 06		
2	(W)Z,Z Z Z N	iP e e eS	00 46 41 47 26 48 56 42	79 $^{\circ}$ .5 8830	Compression. H - 00:34:31. USCGS: H - 00:34:33. 52 $^{\circ}$ N., 179 $\frac{1}{2}$ $^{\circ}$ W. Andreanof Islands aftershock.
2	(W)Z,Z Z Z Z Z,N (M)E	iP i i ePP e eS M	02 14 23 34 58 17 23 18 55 24 28 52.3	80 $^{\circ}$ .0 8890	Compression. H - 02:02:10. USCGS: H - 02:02:10. 51 $\frac{1}{2}$ $^{\circ}$ N., 180. Andreanof Islands aftershock.
2	(W)Z E	eP e(S)	04 45 59 47 54		
2	(W)Z,Z	eP	07 46 16		USCGS: H - 07:34:04. Andreanof Islands, Aleutian Islands.
2	(W)Z,Z (L)N	eP iS	11 38 03 47 59	78 $^{\circ}$ .5 8720	H - 11:25:59. USCGS: H - 11:25:56. Bismarck Sea.
2	(W)Z,Z	eP	13 54 28		



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2	(W)Z Z (L)N (L)N	eP e iS M	23 30 31 31 33 34 11 39.6	20°.0 2220	H - 23:25:54.
2	(W)Z,Z Z	eP ePP	23 41 29 42 57		USCGS: H - 23:34:31. Northern Greece.
3	(W)Z,Z	eP	01 45 16		USCGS: H - 01:35:02. 38½° N., 141° E. Honshu, Japan.
3	(W)Z,Z	iP	05 29 00		Compression. USCGS: H - 05:16:56. Depth: about 100 km. 51½° N., 179° W. Andreanof Islands, Aleutian Islands.
3	(W)Z,Z	eP	09 41 57		
4	(W)Z,Z	iP	01 23 57		Compression.
4	(W)Z (W)E,NE N	eP eS i	09 46 22 48 04 30	8°.9 990	H - 09:44:09.
4	Z Z	eP e	12 57 49 58 01		
4	(W)Z,Z Z	eP e	14 49 45 50 09		USCGS: H - 14:39:30. 34° N., 140° E. South of Honshu, Japan.
4	(W)Z,Z (W)Z,Z Z (W)Z (L)N (L)N (L)E,E (L)N (L)E (L)E	eP ipP e e e iS ePS isS i M	17 01 34 46 02 30 03 09 30 09 54 10 07 23 11 52 29.9	62°.4 6930	H - 16:51:16. Depth: about 60 km. USCGS: H - 16:51:22. Depth: about 60 km. 40° N., 142½° E. Off coast of northern Honshu, Japan.
4	(W)Z,Z Z (W)E E,N (L)E	iP epP e ePS M	17 32 45 56 34 46 41 19 18 01.6		Compression. USCGS: H - 17:22:31. Depth: about 60 km. 40° N., 142½° E. Off coast of northern Honshu, Japan.
4	(W)Z	ePKP	19 25 18		USCGS: H - 19:06:15. 16° S., 173° W. Samoa Island.
5	(W)Z	eP	00 40 53		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
5	(W)Z,Z	iP	02 05 30	79 <sup>o</sup> .5	Compression. H - 01:53:20. USCGS: H - 01:53:16. 51 $\frac{1}{2}$ <sup>o</sup> N., 180. Andreanof Islands, Aleutian Islands. Mag: 6 $\frac{1}{4}$ - 6 $\frac{1}{2}$ (Pas.)
	N	iPcP	39	8830	
	Z	i	06 04		
	(W)Z	iPP	08 31		
	(L)NE,E	eS	15 31		
	(L)E	eScS	51		
	(L)E	ePS	16 09		
	(L)E	iSS	20 23		
(L)N	M	43.3			
5	(W)Z,Z	iP	02 25 57		Compression. USCGS: H - 02:13:42. 51 <sup>o</sup> N., 179 $\frac{1}{2}$ <sup>o</sup> E. Andreanof Islands, Aleutian Islands.
	Z	iPcP	26 05		
	Z	ePP	28 58		
	N	e	35 44		
5	(W)Z,Z	iP	06 20 08	48 <sup>o</sup> .9	Compression. H - 06:11:19. USCGS: H - 06:11:18. 24 $\frac{1}{2}$ <sup>o</sup> N., 122 <sup>o</sup> E. Near northeast coast of Formosa.
	(W)E,Z	i	22	5430	
	Z	i	33		
	(M)E	i	42		
	Z,(M)E,(L)E	iPP	22 04		
	(L)E	e	27 02		
	(L)EN,(M)E,E	iS	12		
	E	eSS	30 35		
(L)N	e	31 10			
(L)E,(M)E	M	43.3			
5	(W)Z,Z	iP	06 27 46		Dilatation.
5	(W)Z,Z	eP	09 08 40		
5	(W)Z,Z	iP	15 05 41	54 <sup>o</sup> .8	Dilatation. H - 14:56:07. USCGS: H - 14:56:13. 36 $\frac{1}{2}$ <sup>o</sup> N., 1 $\frac{1}{2}$ <sup>o</sup> E. Near north coast of Algeria.
	E	ePcP	06 45	6090	
	(L)E	eS	13 21		
	(L)N	eScS	15 35		
	(L)N	M	32.6		
5	(W)Z,Z	eP	15 46 00	11 <sup>o</sup> .3	H - 15:43:14. USCGS: H - 15:43:07. 40 <sup>o</sup> N., 75 $\frac{1}{2}$ <sup>o</sup> E. Sinkiang province, China.
	N	eS	48 08	1250	
	(M)E	eL	49 29		
	(M)E	M	51.0		
5	(W)Z	eP	15 52 54	11 <sup>o</sup> .5	H - 15:50:06.
	(W)E	eS	55 04	1280	
5	(W)Z,Z	eP	15 55 01	11 <sup>o</sup> .2	H - 15:52:17.
	(W)E	eS	57 08	1240	
5	(W)Z,Z	iP	16 44 10		Dilatation.
5	(W)Z,Z	eP	22 56 50		USCGS: H - 22:45:17. Marianas Islands.
	E	ePcP	57 05		
	Z	ePP	59 29		
	E	e	23 02 31		
6	(W)Z,Z	iP	01 28 42		Compression. USCGS: H - 01:17:09. 12 <sup>o</sup> N., 144 <sup>o</sup> E. Marianas Islands.
	E	ePcP	54		
	Z	e	29 09		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
6	(W)Z,Z N (L)N	eP iS M	01 35 46 37 38 41.1	9 <sup>o</sup> .8 1090	H - 01:33:21.
6	(W)Z,Z (W)Z,Z	iP e	06 09 21 33		Compression. USCGS: H - 05:59:06. 40 <sup>1</sup> / <sub>2</sub> ° N., 142 <sup>1</sup> / <sub>2</sub> ° E. Near north coast of Honshu, Japan.
6	(W)Z	e	10 05 08		
6	Z	e	16 45 31		
7	Z E Z Z Z (M)E N,(M)E (L)N (M)E	iP i i iPP iPPP e eS i M	00 55 06 10 29 53 56 10 57 45 01 00 05 54 07.8	30 <sup>o</sup> .2 3350	Compression. H - 00:48:52. USCGS: H - 00:48:56. 27 <sup>1</sup> / <sub>2</sub> ° N., 101° E. Sikang province, China.
7	Z E (L)N E (L)N	iP i iS e M	15 36 27 40 41 27 42 02 47.7	30 <sup>o</sup> .3 3370	Dilatation. H - 15:30:12. USCGS: H - 15:30:15. 27° N., 100 <sup>1</sup> / <sub>2</sub> ° E. Sikang province, China.
7	Z	e	19 07 03		
8	Z Z Z (L)N	eP e ePP e(S)	02 52 06 38 54 03 59 40		
8	Z	eP	04 37 33		
8	(W)Z,Z	eP	13 59 21		USCGS: H - 13:47:22. Near Islands, Aleutian Islands.
8	(W)Z	e	17 27 12		USCGS: H - 17:08:13. Depth: about 100 km. 16° N., 94° W. Near coast of Chiapas, Mexico.
8	(W)Z	e	17 53 54		
9	(W)Z	eP	01 12 36		
9	(W)Z,Z	iP	03 17 35		Compression.
9	(W)Z	eP	03 35 17		
10	(W)Z,Z Z (L)E	eP e M	23 07 41 48 11.0		



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DATE	COMPT.	PHASE	GMT			$\Delta$ km.	REMARKS
			h.	m.	s.		
11	(W)Z	ePKP	22	37	47		USCGS: H - 22:19:40. Depth: about 600 km. 27° S., 63° W. Santiago del Estero province, Argentina.
	(W)Z,Z	i		38	00		
	Z	i			28		
	N	e		40	14		
	(W)Z,Z	ipPKP			38		
	Z	e		41	26		
	N	iPKS			34		
	N	i		42	01		
	(M)E,(L)E	iSKS		43	53		
	N	e		46	43		
	E	e		49	39		
	N	ePPS		53	47		
	(L)E	e		55	54		
	(L)E	eSS		58	11		
11	(W)Z,Z	iP	23	15	47		Dilatation. USCGS: H - 23:06:18. Off coast of Luzon, Philippine Islands.
12	(W)Z	eP	01	05	36	8° .4	H - 01:03:30.
	(W)E	eS		07	13	930	
12	(W)Z,Z	ePKP	01	34	23		USCGS: H - 01:15:25. 29½° S., 178½° W. Kermadec Islands.
12	Z	eP	09	34	03		
12	(W)Z,Z	eP	20	41	40	65° .6	H - 20:30:52. USCGS: H - 20:30:45. 49° N., 155° E. Kurile Islands.
	Z	i			59	7290	
	Z	e		42	31		
	(W)Z	e			41		
	Z	e		43	03		
	Z	e			28		
	(L)N	eS		50	25		
	(M)E	eScS		51	39		
	(M)E	e		53	02		
	(M)E	eSS		54	44		
	(L)EN	e		58	31		
(M)E	M		21	08.6			
13	(W)Z,Z	iP	01	10	37	6° .9	Dilatation. H - 01:08:52.
	(W)E,E	iS		11	57	770	
13	Z	eP	05	15(09)			USCGS: H - 05:05:28. 29½° N., 130° E. Ryukyu Islands.
	(L)E	M		40.6			
13	(W)Z,Z	eP	09	20	51		
13	(W)Z,Z	eP	14	03	52		USCGS: H - 13:52:59. 47° N., 151° E. Kurile Islands.
13	(W)Z	eP	19	26	14		USCGS: H - 19:17:21. 24° N., 122½° E. Off coast of Formosa.
13	(W)Z,Z	eP	19	59	24		USCGS: H - 19:49:00. Northern Celebes.



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
14	(W)Z	ePKP	06 30 35	131 <sup>o</sup> .5	H - 06:11:20. USCGS: H - 06:11:18. 20 <sup>o</sup> N., 107 <sup>o</sup> W. Off coast of Colima, Mexico. Mag: 7 (Pas.)
	(W)E	ePP	33 03	14610	
	E	ePKS	34 03		
	(M)E, (L)E	e	31		
	(M)E, (L)E	iSS	50 29		
	(L)E	M	07 36.7		
14	(W)Z,Z	eP	10 44 40		USCGS: H - 10:32:04. 1 <sup>o</sup> S., 150 <sup>o</sup> E. New Ireland region.
14	(W)Z	ePKP	15 19 56		USCGS: H - 15:00:30. 1 $\frac{1}{2}$ <sup>o</sup> N., 80 <sup>o</sup> W. Near coast of Ecuador.
14	(W)Z	e	15 50 54		
14	(W)Z	eP	16 09(00)		USCGS: H - 15:59:48. 13 $\frac{1}{2}$ <sup>o</sup> N., 120 <sup>o</sup> E. Near Mindoro Island, Philippine Islands.
14	(W)Z,Z	eP	17 32 15		USCGS: H - 17:21:57. 36 $\frac{1}{2}$ <sup>o</sup> N., 141 $\frac{1}{2}$ <sup>o</sup> E. Near east coast of Honshu, Japan.
	Z	i	27		
	(W)Z	i	45		
	E	ePcP	33 01		
	E	ePP	34 39		
	E	ePPP	36 01		
	(L)N	i	44		
	(L)N	e	38 18		
	(L)E	i	40 55		
	(M)E	e	41 14		
	(L)E	eScS	42 06		
	(L)N	i	24		
	(L)N	e	45 24		
(M)E	M	18 02.3			
14	(W)Z	eP	23 49 47		
15	(W)Z,Z	eP	01 06 18	9 <sup>o</sup> .9	H - 01:03:51. USCGS: H - 01:03:56. 39 $\frac{1}{2}$ <sup>o</sup> N., 71 <sup>o</sup> E. Tadzhik S. S. R.
	(W)Z,Z,E	i	23	1100	
	Z	i	36		
	(W)Z	iS	08 11		
	(L)N	i	20		
	(L)E	iL	09 15		
15	(W)Z	e	10 25 28		USCGS: H - 10:06:16. 16 <sup>o</sup> N., 93 $\frac{1}{2}$ <sup>o</sup> W. Near coast of Chiapas, Mexico.
15	(W)E	eP	12 40 11		USCGS: H - 12:28:36. 28 $\frac{1}{2}$ <sup>o</sup> N., 146 <sup>o</sup> E. Marianas Islands.
15	(W)Z,Z	eP	15 49 11		USCGS: H - 15:36:27. Depth: about 100 km. 3 <sup>o</sup> S., 153 <sup>o</sup> E. New Ireland.
	(W)Z,Z	i(pP)	25		
	Z	i	35		
	(L)N	eSKS	59 32		
	(M)E,E,N	eS	40		
	N	eScS	49		
E	e(sS)	16 00 01			



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15	(W)Z,Z Z (L)E (L)EN (L)E (L)E	iP i iS i M	20 29 29 35 30 36 31 02 17 32.0	5 <sup>o</sup> .7 630	Compression. H - 20:28:01.
16	(W)Z (W)E	eP eS	10 47 27 48 54	7 <sup>o</sup> .5 830	H - 10:45:34.
16	(W)Z,Z	eP	13 22 05		
16	(W)Z (W)Z	eP e	16 45 47 46 32		
17	(W)Z	eP	07 50 58		
17	(W)Z,Z Z Z (L)N Z (W)Z (L)E (L)N (L)E (L)E (L)EN (L)N (M)E	eP e ePcP ePP e ePcS iS e iScS i e iSSS M	08 15 23 36 16 44 17 27 43 20 40 22 29 46 24 19 25 25 26 26 56 39.4	49 <sup>o</sup> .3 5480	H - 08:06:31. USCGS: H - 08:06:31. 22 <sup>o</sup> N., 122 <sup>o</sup> E. Near east coast of Formosa.
17	(W)Z,Z (W)Z	iPKP epPKP	18 18 28 19 26		Dilatation. USCGS: H - 17:59:48. Depth: about 200 km. 20 <sup>1</sup> / <sub>2</sub> <sup>o</sup> S., 175 <sup>o</sup> W. Tonga Islands.
17	(W)Z (W)N	iP iS	21 09 42.1 57.1		Dilatation.
18	(W)Z,Z	iP	04 54 24		Dilatation. USCGS: H - 04:43:26. 46 <sup>1</sup> / <sub>2</sub> <sup>o</sup> N., 155 <sup>o</sup> E. Kurile Islands region.
18	(W)E (W)E	eP e(S)	14 36 (16) 38 29		
18	(W)E,Z E (L)E (L)N,N (L)E (L)N (L)E (M)E	eP e ePP eS e iSS e M	16 16 10 34 18 04 23 18 31 26 51 27 21 37.6	49 <sup>o</sup> .6 5510	H - 16:07:15. USCGS: H - 16:07:20. 24 <sup>o</sup> N., 122 <sup>o</sup> E. Near east coast of Formosa.
18	(W)Z,Z (W)Z (L)NE (W)E (L)N	eP e eS i M	20 22 52 23 04 24 23 25 04 26.5	7 <sup>o</sup> .9 880	H - 20:20:53.



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18	(W)Z,Z (W)Z,Z	eP e	22 37 07 40 09		
19	(W)Z,Z	eP	00 34 20		
19	(W)Z,Z	iP	19 48 49		Dilatation. USCGS: H - 19:36:14. 53° N., 166½° W. Fox Islands, Aleutian Islands.
19	(W)Z,Z N E (L)E	iP ePP eS eScS	21 37 56 41 30 48 18 37	83° .6 9290	Compression. H - 21:25:24. USCGS: H - 21:25:21. 53½° N., 166° W. Fox Islands, Aleutian Islands.
20	(W)Z,Z (W)Z,Z N Z (L)N (L)E (L)N (L)N (L)NE, (W)E, (W)N (M)E, (L)E (L)E (L)E Z (M)E (W)Z,Z	iP i iPcP i i iPP ePPP e iS iScS i i eP'P' M eP'P'P'	12 19 38 41 47 57 22 22 37 24 44 29 33 41 55 30 23 42 46 27 52.0 13 06 38	79° .8 8870	Dilatation. H - 12:07:26. USCGS: H - 12:07:25. 51½° N., 180. Andreanof Islands, Aleutian Islands. Mag: 6¾ (Pas.) 7¼ (Berk).
21	(W)Z (W)E	eP iS	03 05 15 06 31	6° .5 720	H - 03:03:36.
21	(W)Z,Z (W)Z,Z E (L)N,N (L)N (L)N	eP i ePcP eS eScS M	11 02 13 28 39 11 20 12 20 33.7	69° .4 7710	H - 10:51:01. USCGS: H - 10:51:00. 52° N., 161½° E. Off coast of Kamchatka.
21	(W)Z,Z (W)Z (W)Z Z Z (L)N N	iP e ePcP epP e eS e	12 50 20 30 57 51 41 53 01 58 17 59 18	62° .2 6910	Dilatation. H - 12:40:33. Depth: about 350 km. USCGS: H - 12:40:28. Depth: about 350 km. 29° N., 139½° E. Bonin Islands region.
21	Z E Z	eP ePcP e	16 10 25 37 11 18		USCGS: H - 15:58:55. 12° N., 144° E. Marianas Islands.
21	(W)Z	eP	19 33 32		
21	(W)Z	eP	21 15 23		



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DATE	COMPT.	PHASE	GMT			$\Delta$ km.	REMARKS
			h.	m.	s.		
22	(W)E	eP	00	37	14	6 <sup>o</sup> .8	H - 00:35:31.
	(W)E	eS		38	33	750	
22	(W)E	eP	02	17	(14)		
	(W)E	i(S)		19	25		
22	(W)Z,Z	eP	15	53	18	11 <sup>o</sup> .4	H - 15:50:31.
	(W)E	iS		55	27	1270	
22	(W)Z	eP	17	02	14	14 <sup>o</sup> .5	H - 16:58:46.
	(W)E	eS		04	56	1610	
23	(W)Z	eP	08	46	39		
	(W)E	e		47	21		
23	(W)Z,Z	eP	08	49	54		USCGS: H - 08:59:43. Depth: about 60 km. 37 <sup>o</sup> N., 141 <sup>o</sup> E. Near east coast of Honshu, Japan.
23	(W)Z,Z	eP	11	22	14	11 <sup>o</sup> .5	H - 11:19:26. USCGS: H - 11:19:18. 42 <sup>o</sup> N., 71 <sup>o</sup> E. Kirgiz S. S. R.
	(W)Z,Z	ePP			25	1280	
	Z	i		23	47		
	(W)E,Z	eS		24	24		
	(L)EN	M		26	9		
23	(W)Z,Z	iP	22	24	02	64 <sup>o</sup> .5	Compression. H - 22:13:30. Depth: about 60 km. USCGS: H - 22:13:31. Depth: about 60 km. 44 <sup>1</sup> / <sub>2</sub> <sup>o</sup> N., 149 <sup>o</sup> E. Kurile Islands.
	(W)E,Z	ipP			20	7170	
	(W)Z	iPcP			38		
	Z	ePP		26	32		
	Z	e			59		
	Z	ePPP		27	42		
	Z	ePcS		28	42		
	(L)E	iS		32	34		
	(L)N	iPS			52		
	E	esS		33	00		
	(L)N	iScS			47		
	(L)E	e		34	13		
	(L)E	M		55	1		
24	(W)E	e	04	44	54		USCGS: H - 04:36:20. Bangka Island, Netherlands Indies.
	(W)Z	e		45	03		
25	(W)Z	eP	01	14	58		
	Z	e		15	32		
25	(W)Z	eP	06	33	54		
	(W)E	e(S)		36	12		
25	(W)Z	eP	17	51	03	55 <sup>o</sup> .6	H - 17:41:23. USCGS: H - 17:41:27. 9 <sup>1</sup> / <sub>2</sub> <sup>o</sup> N., 122 <sup>o</sup> E. Negros Island, Philippine Islands.
	Z	e			18	6180	
	(W)Z	e			25		
	Z	ePP		53	18		
	(L)E	eS		58	48		
	(L)N	iSS		18	02	47	
	(L)N	M		17	6		
25	(W)Z,Z	iP	18	08	46	7 <sup>o</sup> .5	H - 18:06:53.
	(W)E	i			53	830	
	E	eS		10	13		



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DATE	COMPT.	PHASE	GMT		$\Delta$ km.	REMARKS
			h.	m. s.		
26	(W)Z	eP	10	39 07		
26	(W)Z	eP	13	12 19	7 <sup>o</sup> .5	H - 13:10:26.
	(W)ZE	eS		13 46	830	
27	(W)Z,Z	iP	10	16 36	10 <sup>o</sup> .0	Compression. H - 10:14:08. USCGS: H - 10:14:06. 32 <sup>o</sup> N., 78 <sup>1</sup> / <sub>2</sub> E. India - Tibet border.
	Z	i		49	1110	
	Z	i		17 06		
	(W)N,N	i		41		
	(W)N,E	iS		18 30		
	(L)E	iL		19 00		
	(M)E	M		21.4		
27	(W)Z	eP	10	44 56	10 <sup>o</sup> .0	H - 10:43:28. India - Tibet border aftershock.
	(W)Z	i		45 22	1110	
	(W)E	iS		46 50		
27	(W)Z	eP	12	13 48	10 <sup>o</sup> .0	H - 12:12:20. India - Tibet border aftershock.
	(W)E	eS		15 42	1110	
27	Z	eP	13	48 38	10 <sup>o</sup> .0	H - 13:46:10. USCGS: H - 13:46:10. 31 <sup>1</sup> / <sub>2</sub> N., 78 <sup>1</sup> / <sub>2</sub> E. Tibet - India border.
	(W)N,N	iS		50 32	1110	
27	(W)Z,Z	iP	16	22 25	66 <sup>o</sup> .4	Dilatation. H - 16:11:44. Depth: about 100 km. USCGS: H - 16:11:44. 1 <sup>o</sup> N., 128 <sup>1</sup> / <sub>2</sub> E. Halmahera Island.
	Z	i		31	7380	
	(W)E	ipP		47		
	Z	ePP		25 00		
	(L)N	iS		31 06		
	(L)N	eSS		35 12		
	(L)N	eSSS		38 33		
27	(W)Z,Z	eP	20	02 26		
28	(W)Z,Z	eP	04	37 51	57 <sup>o</sup> .2	H - 04:28:00. USCGS: H - 04:28:07. 86 <sup>1</sup> / <sub>2</sub> N., 70 <sup>o</sup> E. North Polar region. Mag: 6 (Pas.)
	Z	e		38 01	6350	
	Z	ePP		40 01		
	(L)N,E	iS		45 46		
	(L)N	iSS		49 42		
	(L)E	M		05 03.2		
28	(W)Z	iP	05	37 36		Dilatation. USCGS: H - 05:27:34.
28	(W)Z,Z	eP	16	56 24		100 miles off east coast of Mindanao, Philippine Islands.
28	(W)Z	eP	22	08 22		
29	(W)Z,Z	eP	03	34 06	60 <sup>o</sup> .5	H - 03:23:52. USCGS: H - 03:23:58. 8 <sup>1</sup> / <sub>2</sub> N., 127 <sup>o</sup> E. Off east coast of Mindanao Island, Philippine Islands.
	(L)E	eS		42 21	6720	
29	(W)Z	i	03	37 24		
	(W)Z	i		48		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
29	(W)Z,Z (L)E N	eP i(PoS) eS	03 44 24 48 56 52 28	58 <sup>o</sup> .7 6520	H - 03:34:22. USCGS: H - 03:34:22. 10 <sup>o</sup> N., 126 $\frac{1}{2}$ <sup>o</sup> E. Off north coast of Mindanao Island, Philippine Islands.
29	(W)Z	eP	04 23 01		
29	(W)Z,Z (W)Z (L)E	iP e e(S)	04 58 37 51 06 28		Dilatation.
29	(W)Z,Z Z (L)E	iP e e(S)	05 04 25 37 12 21		Dilatation.
29	(W)Z,Z (W)Z (W)Z (W)E	eP e e e(S)	06 47 27 39 49 25 34		
29	(W)Z (W)E	eP eS	06 49 49 51 13	7 <sup>o</sup> .2 800	H - 06:48:00.
29	(W)Z,Z (W)Z (W)Z (L)E	iP e e iS	10 06 19 29 38 16 53	86 <sup>o</sup> .1 9570	Compression. H - 09:53:35. USCGS: H - 09:53:38. 6 $\frac{1}{2}$ <sup>o</sup> S., 148 <sup>o</sup> E. New Guinea.
29	(W)Z,Z Z	eP e	15 50 18 29		USCGS: H - 15:40:18. 8 $\frac{1}{2}$ <sup>o</sup> N., 125 $\frac{1}{2}$ <sup>o</sup> E. Mindanao, Philippine Islands.
29	(W)Z (W)ZE	eP iS	17 24 05 25 22	6 <sup>o</sup> .6 730	H - 17:22:24.
29	(W)Z	eP	22 15 33		
30	(W)Z (W)E	eP eS	01 55 42 57 13	7 <sup>o</sup> .9 880	H - 01:53:43.
30	Z	eP	02 45 33		
30	(W)Z (W)Z	eP eS	03 37 04 38 46	8 <sup>o</sup> .9 990	H - 03:34:51.
30	(W)Z,Z (L)E	eP M	04 18 14 47.5		USCGS: H - 04:07:16. 48 $\frac{1}{2}$ <sup>o</sup> N., 155 $\frac{1}{2}$ <sup>o</sup> E. Kurile Islands.
30	(W)Z	e	13 30 18		
30	(W)Z (L)E	eP M	14 02 57 09.1		
30	(W)Z (W)E (W)E	iP i iS	21 36 00.0 04.8 18.6		Compression.



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
30	(W)Z	eP	22 11 58	59 <sup>o</sup> .5	H - 22:01:51.
	Z	e	12 01	6610	
	(L)N	eS	20 07		
	(L)N	e	21 08		
	(L)N	eSS	24 04		
	(L)N	eSSS	26 20		
	(L)N	M	38.5		

( M. Idris )

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PAKISTAN METEOROLOGICAL SERVICE

Director: S. N. NAQVI

GEOPHYSICAL REVIEW

Vol. I. 1955

Part I. Seismology

No. ~~8~~ 9

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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
1	(W)E	eP	04 34 (15)		
1	(W)E	eP	04 49 12	6 <sup>o</sup> .8	H - 04:47:29.
	(W)E	eS	50 31	750	
1	(W)Z,Z	iP	17 23 16		
2	(W)Z	eP	01 14 12.0	2 <sup>o</sup> .3	H - 01:13:32.
	(W)E	iS	43.0	270	
3	(W)Z,Z	eP	08 12 59	78 <sup>o</sup> .7	Compression.
	(L)N	eS	22 56	8740	H - 08:00:53.
	(L)N	M	45.0		USCGS: H - 08:00:53. 51 <sup>o</sup> N., 177 <sup>o</sup> E. Rat Islands, Aleutian Islands.
3	(W)E,Z	eP	08 15 13		
3	(W)Z,Z	iP	14 03 40	7 <sup>o</sup> .3	Dilatation.
	Z	i	56	810	H - 14:01:49.
	Z	i	04 11		USCGS: H - 14:01:46.
	E	iS	05 05		37 <sup>o</sup> N., 71 <sup>o</sup> E.
	(M)E	M	06.6		Hindu Kush.
3	(W)Z	eP	14 38 33	78 <sup>o</sup> .5	H - 14:26:29.
	(W)Z	iPcP	45	8720	USCGS: H - 14:26:32.
	(W)Z,Z	iPP	41 38		52 <sup>o</sup> N., 178 <sup>o</sup> E.
	(L)N	iS	48 29		Rat Islands,
	(L)E	iSoS	57		Aleutian Islands.
	(L)E	e	53 17		
	(L)N	M	15 12.1		
3	(W)Z	e	15 33 00		
4	(W)Z,Z	iP	14 31 48	78 <sup>o</sup> .3	Compression.
	(W)Z	iPcP	56	8700	H - 14:19:44.5
	Z	iPP	34 45		USCGS: H - 14:19:44.
	(L)N	iS	41 43		51 <sup>1</sup> / <sub>2</sub> <sup>o</sup> N., 177 <sup>o</sup> E.
	Z	eP'P'	58 44		Rat Islands,
	(L)E	M	15 05.2		Aleutian Islands.
	Z	eP'P'P'	18 51		Mag: 6 <sup>1</sup> / <sub>2</sub> - 6 <sup>3</sup> / <sub>4</sub> (Pas.)
4	(W)Z,Z	eP	14 40 33		
4	(W)Z	eP	22 35 36		
	(W)ZE	e(S)	36 53		
4	(W)Z,Z	eP	23 05 42	59 <sup>o</sup> .4	H - 22:55:35.
	E	ePP	07 50	6590	USCGS: H - 22:55:39.
	(L)E	eS	13 50		Near east coast of
	(L)E	eSoS	15 40		Mindanao, Philippine
	(L)E	eSSS	20 31		Islands.
	(L)N	M	34.6		
5	(W)Z,Z	eP	00 29 11		USCGS: H - 00:19:09. Mindanao aftershock.



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DATE	COMPT.	PHASE	GMT			$\Delta$ km.	REMARKS
			h.	m.	s.		
5	(W) Z, Z	eP	04	15	25		USCGS: H - 04:03:25. Depth: about 100 km. Rat Islands, Aleutian Islands.
5	(W) Z, Z	eP	08	37	58		
	(W) Z	e		38	51		
5	(W) Z	e	19	33	16		
6	(W) Z, Z	iP	02	05	14	67 <sup>o</sup> .0 7440	Compression. H - 01:54:17. USCGS: H - 01:54:17. 51 <sup>o</sup> N., 158 <sup>o</sup> E. Kamchatka. Mag: 6 $\frac{3}{4}$ (Pas.)
	Z	e			26		
	(L) E	ePP		07	38		
	(L) N	ePPP		09	23		
	(L) N	iS		14	07		
	(L) N	e		19	41		
	Z	eP'P'		33	34		
	(M) E	M		38.	7		
6	(W) Z, Z	eP	10	42	20	84 <sup>o</sup> .0 9330	H - 10:29:46.5. USCGS: H - 10:29:40. 54 $\frac{1}{2}$ <sup>o</sup> N., 162 $\frac{1}{2}$ <sup>o</sup> W. Near south coast of Alaska Peninsula.
	(L) N	eS		52	44		
6	(W) Z, Z	ePKP	15	18	15		USCGS: H - 14:59:21. Depth: about 100 km. 24 $\frac{1}{2}$ <sup>o</sup> S., 177 <sup>o</sup> W. Tonga Islands region.
6	(W) Z	eP	18	37	45		
7	(W) Z, Z	eP	09	06	47		
7	(W) Z, Z	eP	09	08	45	27 <sup>o</sup> .6 3055	H - 09:02:54.
	(L) E	eS		13	26		
	(L) N	M			18.8		
7	(W) Z, Z	eP	09	56	22		USCGS: H - 09:51:19. 31 <sup>o</sup> N., 93 <sup>o</sup> E. China - Tibet border.
	(W) E	e			41		
	(L) E	iS	10	00	(39)		
	(L) E	M			07.1		
7	(W) Z, Z	eP	18	22	08	78 <sup>o</sup> .1 8680	H - 18:10:06. USCGS: H - 18:10:02. Rat Islands, Aleutian Islands.
	(L) E, (M) E	eS		32	02		
7	(W) Z, Z	eP	22	20	01.8		
	Z	i			03.6		
	Z	i			08.1		
	(W) N, N, Z	i(S)			22.5		
8	(W) Z, Z	eP	14	18	26	25 <sup>o</sup> .4 2820	H - 14:12:55. USCGS: H - 14:12:52. 29 $\frac{1}{2}$ <sup>o</sup> N., 97 <sup>o</sup> E. Sikang province, China
	(W) Z, Z	e			37		
	(L) E	eS		22	51		
	(L) N	M			30.0		
8	(W) Z, Z	ePKP	18	38	01		USCGS: H - 18:20:11. Depth: about 600 km. 21 <sup>o</sup> S., 179 $\frac{1}{2}$ <sup>o</sup> W. Fiji Islands foreshock.



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
8	(W)Z, Z (W)Z, N (L)E (L)E (L)N	iPKP ePP iSKS i ePKKP	18 57 01 58 32 03 12 04 42 07 16		Dilatation. USCGS: H - 18:39:11. Depth: about 600 km. 20 $\frac{1}{2}$ $^{\circ}$ S., 179 $\frac{1}{2}$ $^{\circ}$ W. Fiji Islands.
8	(W)Z	eP	19 07 07		
8	(W)Z, Z N E (M)E (L)EN (L)N, (M)E (M)E (M)E, (L)E (L)N	iP iPcP epP ePP iPcS iS iScS isS eSS	19 11 46 12 50 13 36 14 05 16 55 18 37 20 27 22 08 32	53 $^{\circ}$ .9 5990	Dilatation. H - 19:03:16. Depth: about 600 km. USCGS: H - 19:03:09. Depth: about 600 km. 5 $^{\circ}$ S., 110 $^{\circ}$ E. Java Sea.
•	(W)Z	ePKP	18 43 57		USCGS: H - 18:24:00. Mendoza province, Argentina.
10	(W)Z, Z E N E (L)N	eP • ePcP ePP ePcS	00 00 59 01 23 02 10 36 06 51		USCGS: H - 23:53:20. 40 $\frac{1}{2}$ $^{\circ}$ N., 22 $^{\circ}$ E. Northern Greece.
10	(W)Z	ePKP	07 11 52		USCGS: H - 06:51:58. Mendoza province, Argentina.
10	(W)Z, Z (L)E (L)E (L)E (L)N	ePKP e eSKS ePS M	14 39 52 43 07 47 01 51 33 15 43.3		USCGS: H - 14:20:52. 20 $^{\circ}$ S., 175 $\frac{1}{2}$ $^{\circ}$ W. Tonga Islands. Mag: 6 $\frac{1}{4}$ (Pas.)
10	(W)Z, Z	e	15 18 35		
10	(W)Z	e	17 06 38		
10	(W)Z, Z (W)E	iP iS	19 47 08 48 28	6 $^{\circ}$ .9 770	Dilatation. H - 19:45:23.
11	(W)Z	e	05 16 31		
11	(W)Z, Z (W)Z, Z (L)N, N (L)E (L)N (L)N	iP iPcP iS iScS ePS M	20 33 48 51 44 08 28 47 21 10.9	83 $^{\circ}$ .2 9240	Compression. H - 20:21:19. USCGS: H - 20:21:20. 1 $\frac{1}{2}$ $^{\circ}$ S., 13 $^{\circ}$ W. Atlantic Ocean.
12	(W)Z (W)E, E	eP iS	03 03 48 05 05	6 $^{\circ}$ .6 730	H - 03:02:07.
12	(W)Z, Z (W)E	eP iS	17 49 02.3 20.1		
12	(W)Z	e	21 26 33		



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DATE	COMPT.	PHASE	GMT		$\Delta$ km.	REMARKS
			h.	m. s.		
12	(W)Z	e	22	24 56		
13	(W)Z	e	01	55 30		
13	(W)Z,Z	e	02	58 55		
13	Z	eP	08	14(06)		
13	(W)Z (L)EN	iP iS	15	44 48.8 45 06.8		
13	(W)Z,Z E (L)N (L)E	eP e eS ePS	18	53 41 54 19 04 32 05 53	89 <sup>o</sup> .8 9980	H - 18:40:39. USCGS: H - 18:40:34. 6 <sup>o</sup> S., 154 $\frac{1}{2}$ <sup>o</sup> E. Solomon Islands.
13	(W)Z,Z N	ePKP eSKS	20	35 09 41 53		USCGS: H - 20:16:28. Sandwich Islands region.
13	(W)Z,Z (W)Z	eP epP	22	33 27 48		
14	(W)Z (L)N	iP eS	04	07 08 18 02	90 <sup>o</sup> .5 10050	Dilatation. H - 03:54:03. USCGS: H - 03:54:02. 6 <sup>o</sup> S., 154 $\frac{1}{2}$ <sup>o</sup> E. Solomon Islands.
14	(W)Z,Z Z (L)N,N (L)E N	eP ePPP iS iPcS eSS	09	58 20 10 00 02 03 45 04 52 05 47	34 <sup>o</sup> .0 3780	H - 09:51:33. USCGS: H - 09:51:37. 8 $\frac{1}{2}$ <sup>o</sup> N., 94 <sup>o</sup> E. Nicobar Islands.
14	(W)Z,Z	eP	10	27 36		Compression. USCGS: H - 10:17:27. Depth: about 60 km. 36 $\frac{1}{2}$ <sup>o</sup> N., 141 <sup>o</sup> E. Near east coast of Honshu, Japan.
14	(W)Z,Z	iP	11	52 06		Dilatation.
14	(W)Z,Z	e	15	13 44		
14	(W)Z	eP	16	06 28		USCGS: H - 15:56:10. Off east coast of Honshu, Japan.
14	(W)Z	e	17	55 22		
15	(W)Z (W)E	eP eS	11	03 09 04 42	8 <sup>o</sup> .1 900	H - 11:01:07.
15	(W)Z (W)E	eP eS	16	21(33) 23 09		
15	(W)Z,Z	e	20	03 02		
15	(W)Z,Z	e	23	27 13		



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DATE	COMPT.	PHASE	GMT		$\Delta$ km.	REMARKS
			h.	m. s.		
16	(W)Z,Z	eP	01	04 14	24°.0	H - 00:58:57.
	(W)E	e		41	2670	
	Z	ePP		50		
	(L)N	eS		08 29		
16	(W)Z,Z	eP	07	13 53	34°.0	H - 07:07:05.5. USCGS: H - 07:07:08. 37½° N., 27° E. Dodecanese Islands. Mag: 6¾ - 7 (Pas.)
	Z	i		14 22	3780	
	(M)E	iPPP		36		
	(W)E,E	iS		19 18		
	(M)E	iPcS		20 19		
	(M)E	eSS		21 23		
	(M)E,E	i		22 52		
	(M)E	M		29.4		
16	(W)Z	eP	13	17 34		
17	(W)Z,Z	eP	00	25 55		
17	(W)Z	iP	08	04 54		Compression. USCGS: H - 07:54:02. 46½° N., 153° E. Kurile Islands.
	(L)N	e		12 06		
	(L)N	M		37.0		
17	(W)Z,Z	iP	08	21 43	6°.9	Dilatation. H - 08:19:58. USCGS: H - 08:19:41. 38° N., 71° E. Northern Afghanistan.
	E	iS		23 03	770	
17	(W)Z,Z	eP	12	34 13		USCGS: H - 12:21:42. 53° N., 170° W. Fox Islands, Aleutian Islands.
17	(W)Z,Z	eP	12	37 02		
17	(W)Z	iP	15	28 54.2		
17	(W)Z,Z	eP	22	10 54	84°.0	H - 21:58:20.5. USCGS: H - 21:58:25. 54° N., 168° W. Fox Islands, Aleutian Islands. Mag: 5¾ - 6 (Pas.)
	(W)Z	ePcP		11 02	9330	
	(L)N	eS		21 18		
	(L)E	M		47.4		
18	(W)Z	ePKP	01	13 09		USCGS: H - 00:54:37. 18° S., 170° E. New Hebrides Islands region.
18	(W)Z,Z	iP	02	27 31		Compression. USCGS: H - 02:14:59. 52½° N., 169° W. Fox Islands, Aleutian Islands.
	(W)Z	i		42		
18	(W)Z,Z	e	03	27 30		
18	(W)Z,Z	e	07	25 50		
18	(W)Z,Z	eP	10	24 51		USCGS: H - 10:14:14. 44½° N., 149° E. Kurile Islands.



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
18	(W)Z	eP	10 37 01		USCGS: H - 10:26:26. 45° N., 149° W. Kurile Islands.
18	(W)Z,Z	eP	10 47 00		USCGS: H - 10:36:24. 44½° N., 149° E. Kurile Islands.
18	(W)Z,Z	eP	10 51 33		USCGS: H - 10:40:55. 44½° N., 149° E. Kurile Islands.
18	(W)Z,Z (W)Z Z (M)E,N N	iP ePcP ePP iS eScS	11 43 56 44 01 47 18 54 23 37	84° .6 9400	Compression. H - 11:31:20.
18	(W)Z,Z (W)Z	ePKP i	11 48 08 30		USCGS: H - 11:29:58. Depth: about 150 km. 13½° S., 167° E. New Hebrides Islands.
18	(W)Z,Z	eP	11 59 31		
18	Z (L)E	eP i	13 21(46) 25 46		
18	(W)Z	eP	16 19 21		
19	(W)Z,Z E E (M)E (M)E	iP iPPP i iS M	08 50 00 14 51 37 50 53.7	9° .6 1070	Compression. H - 08:47:37.5. USCGS: H - 08:47:36. 40° N., 68° E. Uzbek S. S. R.
19	(W)Z,Z (W)E,N	eP iS	15 16 07 17 35	7° .6 840	H - 15:14:12.
19	(W)Z,Z (L)N	iP eS	16 02 31 11 50	71° .6 7950	H - 15:51:06. USCGS: H - 15:51:06. 12° N., 143° E. Marianas Islands region.
19	(W)Z,Z N N (L)N (L)N	eP ePP ePPP iS M	16 33 45 37 05 38 50 44 17 17 17.7	85° .7 9520	H - 16:21:03. USCGS: H - 16:21:05. 60½° N., 145½° W. Near south coast of Alaska.
19	(W)Z	e	17 35 59		
19	(W)Z,Z N N (W)Z	iP ePcP epP ePP	20 04 18 23 34 07 07		Dilatation. USCGS: H - 19:52:15. Depth: about 60 km. 51½° N., 178° E. Rat Islands, Aleutian Islands.
19	(W)Z (W)E	eP e(S)	23 13 04 14 49		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
20	(W)Z	eP	00 05 13	87 <sup>o</sup> .6	H - 23:52:22.
	(W)Z, Z	ePP	08 37	9730	USCGS: H - 23:52:25.
	(L)E	eSKS	15 34		56 $\frac{1}{2}$ <sup>o</sup> N., 153 <sup>o</sup> W.
	N	eS	54		Near south coast of
	(L)E	iS	58		Kodaik Island. Mag: 6 (Pas.)
20	(W)Z	e	02 52 23		
20	(W)Z	e	03 00 29		
20	(W)Z, Z	iP	04 20 08		Dilatation. USCGS: H - 04:07:53. Andreanof Islands, Aleutian Islands.
20	(W)Z, Z	eF	04 33 15		
20	Z	eP	07 44 26	86 <sup>o</sup> .7	H - 07:31:39.
	(L)N	eS	55 03	9630	USCGS: H - 07:31:45.
	(L)N	eSoS	14		Fox Islands, Aleutian Islands.
20	(W)Z, Z	eP	17 00 48		
20	(W)Z	iP	18 43 55	6 <sup>o</sup> .7	Dilatation.
	(W)E	iS	45 13	740	H - 18:42:13.
20	(W)Z	e	20 31 52		
20	(W)Z, Z	ePKP	21 20 06		USCGS: H - 21:00:43. $\frac{1}{2}$ <sup>o</sup> N., 78 $\frac{1}{2}$ <sup>o</sup> W. Northern Ecuador.
20	(W)Z	eP	22 22 26		
21	(W)Z	ePKP	12 04 59	140 <sup>o</sup> .4	H - 11:45:43.
	Z	e	05 05	15600	Depth: about 100 km.
	Z	ipPKP	33		(Gutenberg Tables
	Z	ePP	08 04		used).
	Z	epPP	30		USCGS: H - 11:45:40.
	Z	iPKS	44		Depth: about 100 km.
	(M)E	epPKS	09 08		25 <sup>o</sup> S., 74 <sup>o</sup> W.
	(M)E	ispKS	14		Southern Peru.
	(L)N	eSKS	12 17		Mag: 6 $\frac{3}{4}$ (Pas.)
	(L)E	i	14 54		
	(L)N	eSS	26 12		
	(L)N	M	13 15.0		
	22	(W)Z	e	04 08 22	
22	(W)Z, Z	e	12 23(07)		
	Z	e	24 14		
22	(W)Z	e	18 46 19		
23	(W)Z, Z	iP	06 29 43	55 <sup>o</sup> .9	Dilatation.
	E	e	57	6210	H - 06:20:01.
	Z	ePcS	34 38		USCGS: H - 06:20:06.
	(L)E	eS	37 30		Negros Island, Philippine Islands.



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
23	(W)Z,Z	eP	11 32 46		USCGS: H - 11:23:08. Negros Island foreshock.
23	(W)Z,Z	eP	11 38 15		
23	(W)Z,Z (W)E Z (M)E,(L)E (L)E	iP ePcP ePP ePcS iS	12 59 40 13 00 09 02 10 04 02 08 45	69 <sup>o</sup> .1 7680	Compression. H - 12:48:30. USCGS: H - 12:48:28. 7 <sup>o</sup> S., 128 $\frac{1}{2}$ <sup>o</sup> E. Banda Sea.
23	Z	eP	13 27 49		
23	(W)Z,Z (W)Z Z Z (L)N (L)E (L)N (L)E	iP i ePP ePPP eS iScS i M	14 06 41 50 08 50 10 07 14 27 16 32 20 30 37.5	55 <sup>o</sup> .7 6190	Compression. H - 13:57:01. USCGS: H - 13:57:04. 9 $\frac{1}{2}$ <sup>o</sup> N., 122 $\frac{1}{2}$ <sup>o</sup> E. Negros Island, P.I.
23	(W)Z	e	15 29 25		
23	(W)Z,Z	eP	18 30 19		
23	Z	e	21 10(14)		
23	(W)Z,Z	eP	23 10 32		
24	(W)Z	ePKP	01 23 51		USCGS: H - 01:04:56. 14 <sup>o</sup> S., 175 <sup>o</sup> W. Samoa Islands.
24	(W)Z,Z Z E (L)N (L)E (L)N (L)N	iP epP ePcP eS isS eScS M	11 12 19 37 13 08 20 27 54 22 04 40.9	60 <sup>o</sup> .8 6750	Compression. H - 11:02:15. Depth: about 100 km. USCGS: H - 11:02:14. Depth: about 100 km. 36 <sup>o</sup> N., 140 <sup>o</sup> E. Southern Honshu, Japan.
24	(W)Z,Z (W)Z (L)E,(M)E (L)EN (L)N (L)N	iP iPcP iPP eS eSS M	16 28 54 30 18 51 35 54 39 27 52.0	48 <sup>o</sup> .3 5370	Compression. H - 16:20:09. USCGS: H - 16:20:03. 24 <sup>o</sup> N., 122 <sup>o</sup> E. Near east coast of Formosa.
24	(W)Z	e	19 52 57		
24	(W)Z (W)E	eP iS	23 32 12 33 29	6 <sup>o</sup> .6 730	H - 23:30:31.
25	(W)Z	e	01 36 08		
25	(W)Z (W)E	eP eS	02 14 22 15 41	6 <sup>o</sup> .8 750	H - 02:12:39.
25	(W)Z	e	05 45 02		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
25	Z	e	06 01(48)		USCGS: H - 05:56:45. China - Tibet border.
25	(W)Z,Z (W)E (L)N	eP e(S) iL	06 35 56 38 10 39 18		
25	(W)Z,Z Z (L)N	ePKP ePP M	11 41 54 45 02 12 48.6		USCGS: H - 11:22:52. Depth: about 200 km. 22 $\frac{1}{2}$ <sup>o</sup> S., 69 $\frac{1}{2}$ <sup>o</sup> W. Northern Chile.
25	(W)Z (L)E	eP iS	18 56 15.9 32.7		
26	(W)Z,Z Z (L)N (L)N (L)N (L)E	eP ePP eSKS iS ePS M	04 17 09 20 30 27 33 51 54 54.6	87 <sup>o</sup> .9 9770	H - 04:04:16. USCGS: H - 04:04:18. 56 $\frac{1}{2}$ <sup>o</sup> N., 153 <sup>o</sup> W. Kodaik Island fore- shock. Mag: 6 (Pas.)
26	(W)Z,Z	eP	11 43 37		
26	(W)Z	e	13 48 05		
26	(W)Z,Z (W)E (L)E	eP eS M	22 13 06 15 16 17.2	11 <sup>o</sup> .5 1280	H - 22:10:18.
27	(W)Z,Z	eP	00 17 44		Compression.
27	(W)Z,Z N (L)E (L)N	eP eS eSS M	01 30 33 38 24 42 14 52.8	56 <sup>o</sup> .6 6290	Dilatation. H - 01:20:46. USCGS: H - 01:20:50. 34 <sup>o</sup> N., 134 <sup>o</sup> E. Shikoku, Japan.
27	(W)Z,Z	eP	05 12 48		
27	(W)Z	e	07 25 22		
27	(W)Z	e	15 46 31		
27	(W)Z,Z (W)Z (L)N (L)N (L)E,(M)E,E E (L)N (M)E	eP ePP e eSKS iS eSoS ePS M	18 31 59 35 22 42 15 24 41 49 43 46 19 08.7	87 <sup>o</sup> .8 9750	Compression. H - 18:19:07. USCGS: H - 18:19:08. 56 $\frac{1}{2}$ <sup>o</sup> N., 153 <sup>o</sup> W. Near south coast of Kodaik Island. Mag: 6 $\frac{1}{4}$ (Pas.)
27	(W)Z	e	19 44 27		
28	(W)Z (W)E	eP eS	00 00 09 02 22	11 <sup>o</sup> .7 1300	H - 23:57:18.
28	(W)Z,Z (L)N	eP eS	02 09 45 17 33	56 <sup>o</sup> .1 6230	H - 02:00:02. USCGS: H - 02:00:10. Negros Island after shock.



PAKISTAN METEOROLOGICAL SERVICE

Director: S. N. NAQVI



GEOPHYSICAL REVIEW

Vol. I. 1955

Part I. Seismology

No.10.

Seismological Bulletin

August 1955



QUETTA OBSERVATORY

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DATE	COMPT.	PHASE	GMT		$\Delta$ km.	REMARKS
			h.	m. s.		
1	(W)Z,Z N	eP e(S)	16	01 02 03 20		
1	(W)Z,Z Z Z (L)N (L)N	eP epP e eS esS	21	54 57 55 41 56 55 22 03 10 04 42	63°.3 7030	H - 21:44:50. Depth: about 200 km. USCGS: H - 21:44:59. Depth: about 200 km. Off southeast coast of Mindanao, Philippine Islands.
2	(W)Z,Z	eP	02	51 27		
2	(W)Z,Z Z (L)E, (M)E, (L)N (L)E (L)N	iP e e(S) eSS M	06	56 56 57 07 07 02 01 03 47 10.6		USCGS: H - 06:50:16. Nicobar Islands region.
3	(W)Z,Z (L)E (L)N (L)E	eP iS eSS M	17	14 58 18 43 19 26 24.0	20°.5 2280	H - 17:10:18. USCGS: H - 17:10:15. Eastern Tibet.
3	(W)Z,Z (W)E	eP eS	18	19 24 20 51	7°.5 830	H - 18:17:31.
3	(W)Z,Z	iP	19	57 29		Dilatation. USCGS: H - 19:45:20. 52°N., 179½°W. Andreanof Islands, Aleutian Islands.
3	(W)Z,Z	iP	20	29 50		Dilatation. USCGS: H - 20:16:54. New Ireland region.
3	(W)Z	ePKP	22	42 30		USCGS: H - 22:22:40. Santiago del Estero, Argentina.
3	(W)Z,Z	eP	22	45 46		
3	(W)Z,Z (L)N (L)N	eP eS M	22	48 22 53 30 59.7	31°.5 3500	H - 22:41:57.
4	(W)Z,Z Z	eP e	00	05 21 33		USCGS: H - 00:00:00. Bay of Bengal.
4	(W)Z,Z	iP	06	38 44		Dilatation.
4	(W)Z,Z Z (M)E, (L)N (W)E (L)E (L)E	eP e eS e i M	06	44 42 47 47 43 48 43 05 52.4	16°.3 1810	H - 06:40:50. USCGS: H - 06:40:46. 30½°N., 86½°E. Tibet.



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
4	Z (L)E (L)E	iP eSKS iS	11 05 58 16 28 47	89 <sup>o</sup> .3 9920	Compression. H - 10:52:59. USCGS: H - 10:53:01. 5 <sup>o</sup> S., 152 $\frac{1}{2}$ <sup>o</sup> E. Near east coast of new Britain.
4	Z (L)N	eP M	12 27 02 53 18		
4	Z Z	iP e	14 27 23 34		Dilatation. USCGS: H - 14:18:20. 25 $\frac{1}{2}$ <sup>o</sup> N., 125 <sup>o</sup> E. Ryukyu Islands.
4	Z Z (L)N	eP e M	15 22 17 27 48.5		
4	Z Z (L)N	eP e M	15 33 22 31 59.9		
5	(W)Z,Z (L)E (L)E	iP eSS M	10 25 28 29 30 38.7		Dilatation. USCGS: H - 10:20:50. 43 <sup>o</sup> N., 47 $\frac{1}{2}$ <sup>o</sup> E. Daghestan S.S.R.
5	(W)Z	eP	11 23 26		USCGS: H - 11:11:15. 51 <sup>o</sup> N., 179 $\frac{1}{2}$ <sup>o</sup> W. Andreanof Islands, Aleutian Islands.
5	(W)Z	e	13 35 24		
5	(W)Z,Z (W)Z,E	eP eS	18 54 33 55 51	6 <sup>o</sup> .7 740	Dilatation. H - 18:52:51.
6	(W)Z,Z (W)Z (W)Z N (L)E (L)E (L)E (L)N (L)N (L)N	ePKP ePP epPKP epPP esPP eSKS e isSKS eSKKP eSS	08 49 43 51 17 25 52 25 53 01 56 14 57 45 58 47 09 03 23 07 20	121 <sup>o</sup> .0 13440	H - 08:31:26. Depth: about 350 km. (Gutenberg Tables Used). USCGS: H - 08:31:25. Depth: about 350 km. 21 $\frac{1}{2}$ <sup>o</sup> S., 177 $\frac{1}{2}$ <sup>o</sup> W. Tonga Islands region. Mag: 6 $\frac{3}{4}$ (Pas.)
7	(W)Z (L)N	eP eS	12 47 01 57 14	81 <sup>o</sup> .8 9090	H - 12:34:39. USCGS: H - 12:34:41. 3 $\frac{1}{2}$ <sup>o</sup> S., 145 <sup>o</sup> E. Off north coast of new Guinea.
7	(W)Z	eP	17 51 04		USCGS: H - 17:40:30. About 200 miles off south coast of Honshu, Japan.
7	(W)Z	e	18 43 38		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
8	(W)Z	eP	14 07 18		
8	(W)Z	e	15 21 32		
8	(W)Z,Z	eP	19 11 37		
9	Z	e	00 43 43		
9	Z (L)N (L)N	eP eS M	07 34 (04) 38 51 48.6		
10	(W)Z,Z	eP	05 14 29		Dilatation. USCGS: H - 05:01:43. 2°S., 151°E. New Ireland region.
10	(W)Z,Z	eP	11 59 22		
10	(W)Z,Z	eP	15 18 57		
10	(W)Z	e	15 36 03		
10	Z	iP	16 09 30		Dilatation. USCGS: H - 15:59:13. 44°N., 144½°E. Near north coast of Hokkaido, Japan.
10	(W)Z,Z (W)E	iP eS	16 52 43 53 55	6°.1 680	Dilatation. H - 16:51:09.
11	(W)Z,Z	eP	11 36 31		Compression.
11	(W)Z,Z (W)E	iP eS	17 54 02 55 24	7°.1 790	Dilatation. H - 17:52:14.
11	(W)Z	eP	19 36 47		USCGS: H - 19:26:20. Sumbawa Island.
11	(W)Z	e	22 19 20		
11	(W)Z	e	22 52 31		
12	(W)E	e	04 19 33		USCGS: H - 04 03 25. 37°N., 141°E. Near east coast of Honshu, Japan.
12	(W)Z	iP	05 26 49		Dilatation.
12	(W)Z	e	12 03 10		
12	(W)Z (W)Z	eP e	20 39 21 32		Compression.
13	(W)Z,Z	eP	17 21 41		Dilatation.
13	(W)Z,Z	iP	22 46 34.0		Dilatation.
13	(W)Z	eP	22 52 58		



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DATE	COMPT.	PHASE	GMT		$\Delta$ km.	REMARKS
			h.	m. s.		
14	(W) Z	e	13	53 21		
	(W) Z, Z	e		30		
	(L) E, E	iS		55 15		
14	(W) Z	ePKP	17	02 23		USCGS: H - 16:43:20. 33°S., 179°W. Kermedec Islands.
	(L) E	ePP		04 27		
	(L) E	ePKS		06 01		
	(L) N	M	18	02.2		
14	(W) Z, Z	eP	18	43 55	3° .2	H - 18:43:03.
	(L) E	eS		44 34	350	
	(L) E	M		45.1		
14	(W) Z	e	22	41 00		
15	(W) Z, Z	iP	07	11 44	7° .0	Dilatation. H - 07:09:58.
	(W) E	eS		13 05	780	
15	Z	eP	12	10 26	74° .7	H - 11:58:43.
	(L) N	eS		20 02	8300	
	(L) N	M		45.2		
15	(W) Z, Z	eP	15	11 10		USCGS: H - 14:58:27. 3½°S., 149½°E. New Britain region.
15	(W) Z	eP	16	49 33	25° .0	H - 16:44:06. USCGS: H - 16:44:07. 27°N., 95°E. Assam, India.
	(W) Z	e		47	2780	
	(L) E	eS		53 55		
	(L) NE	i		54 39		
	(L) N	M	17	00.5		
15	(W) Z	e	23	16 30		
16	(W) Z, Z	iP	11	59 49	93° .4	H - 11:46:58. Depth: about 200 km. USCGS: H - 11:46:58. Depth: about 200 km. 6°S., 155°E. Solomon Islands.
	(W) Z, Z	ePcP		55	10380	
	Z	epP	12	00 32		
	Z	esP		01 11		
	(L) NE	iSKS		10 06		
	(L) N	iS		34		
	(L) NE	esS		12 13		
	(L) N	M		34.8		
16	(W) Z	e	19	08 58		
16	(W) Z	ePKP	19	29 22		USCGS: H - 19:10:13. 12½°N., 86½°W. Nicoragua.
	(L) N	M	20	27.7		
17	(W) Z	e	10	51 56		
17	(W) Z	e	12	42 51		
17	(W) Z	eP	14	53 08		USCGS: H - 14:42:00. Marianas Islands region.
17	(W) Z, Z	eP	17	40 31		USCGS: H - 17:29:52. Depth: about 350 miles. south of Honshu, Japan.
	(W) Z, Z	e		52		
	(L) N	M	18	13.1		
17	Z	e	17	53 39		



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DATE	COMPT.	PHASE	GMT			$\Delta$ km.	REMARKS
			h.	m.	s.		
17	(W)Z	eP	19	10	12		
17	(W)Z	eP	20	15	29		
18	(W)Z	eP	00	11	23		USCGS: H - 00:01:10. 7°N., 127°E. Near east coast of Mindanao, Phillipine Islands.
18	(W)Z	e	04	30	21		
18	(W)Z	eP	04	54	07		
18	(W)Z	e	11	22	03		
18	(W)Z	e	14	25	07		
19	(W)Z	e	03	42	19		
19	(W)Z	eP	05	17	22		
19	(W)Z,Z (W)Z (W)Z	ePKP iPKP ipPKP	16	47	06 07 49 29		USCGS: H - 16:28:50. Depth: about 650 km. 9°S., 71°W. Acre, Brazil.
20	(W)Z (L)NE (L)E (L)N	eP eS e M	06	21	27 29 26 54 48.4	57°.9 6430	H - 06:11:31. USCGS: H - 06:11:38. 12°N., 126°E. Samar Island, Phillipine Islands.
20	(W)Z (W)E (L)E	eP eS e	18	30	57 33 45 34 44	15°.0 1670	H - 18:27:22.
20	(W)Z	ePKP	19	16	07		USCGS: H - 18:57:28. Depth: about 200 km. 20½°S., 176½°W. Tonga Islands.
20	(W)Z,Z (W)Z	eP e	19	55	03 56 05		
20	(W)Z,Z (W)E	eP e(S)	23	33	10 36 15		
21	(W)Z,Z (W)E (L)E	eP eS M	00	45	00 46 42 48.6	8°.9 990	H - 00:42:47. Dilatation. USCGS: H - 00:42:50. 38°N., 69½°E. Tadzhik, S.S.R.
21	(W)Z,Z (W)E,E	iP iS	03	35	17 36 35	6°.7 740	Dilatation. H - 03:33:35.
21	Z E (L)E	eP e eS	16	09	44 59 14 17	26°.5 2940	H - 16:04:03. USCGS: H - 16:04:01. 24°N., 96½°E. Burma.



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
21	(W)Z,Z	eP	17 45 42	74 <sup>o</sup> .9	H - 17:33:58. USCGS: H - 17:33:58. 3 <sup>o</sup> S., 137 <sup>1</sup> / <sub>2</sub> <sup>o</sup> E. New Guinea. Mag: 6 <sup>3</sup> / <sub>4</sub> - 7 (Pas.)
	(M)E,E	iPcP	46 00	8320	
	Z	ePP	48 33		
	(M)E	ePPP	50 24		
	(L)N, (W)E, N,E	iS	55 19		
	E	eScS	59		
	(W)Z	eP'P'	18 12 58		
	(M)E	M	25.1		
22	(W)Z	eP	10 37 38		
22	(W)Z	eP	13 50 10		
23	(W)Z	eP	10 03 30		Compression. USCGS: H - 09:53:20. Mindanao, Phillipine Islands.
23	(W)Z,Z	eP	14 10 13	3 <sup>o</sup> .3	H - 14:09:16. (From travel time of P only). 31 <sup>o</sup> N., 71 <sup>o</sup> E. Central West Pakistan. Felt: Multan, Montgomery and Bahawalpur. Lahore : P - 14:10:05. Chittagong: P - 14:13:59. USCGS: H - 14:09:17. Depth: about 60 km. 31 <sup>o</sup> N., 71 <sup>1</sup> / <sub>2</sub> <sup>o</sup> E. Central Pakistan.
	E	i	29	370	
	(L)N	eS	54		
	Z	M	12.4		
23	(W)Z	e	15 50 13		
	(L)E	e	58 50		
	(L)E	e	16 02 53		
23	(W)Z,Z	eP	18 20 09		USCGS: H - 18:09:38. Molucca Passage.
23	(W)Z,Z	eP	21 01 40	21 <sup>o</sup> .1	H - 20:56:52. USCGS: H - 20:56:52. 43 <sup>o</sup> N., 46 <sup>o</sup> E. Dagestan A.S.S.R.
	(L)E	eS	05 31	2340	
23	(W)Z,Z	eP	22 52 26		USCGS: H - 22:42:36. 12 <sup>1</sup> / <sub>2</sub> <sup>o</sup> N., 126 <sup>1</sup> / <sub>2</sub> <sup>o</sup> E. Off coast of Samar, Philippine Islands.
	(W)Z	e	33		
23	(W)Z	e	23 02 23		
24	(W)Z	eP	06 03 02		
24	(W)Z	eP	10 20 18		
25	(W)Z,Z	iP	05 54 16	20 <sup>o</sup> .9	Compression. H - 05:49:30. USCGS: H - 05:49:28. 43 <sup>1</sup> / <sub>2</sub> <sup>o</sup> N., 46 <sup>o</sup> E. Daghestan A.S.S.R.
	E	i	20	2320	
	N	eS	58 05		
25	(W)Z	eP	10 09 43		



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DATE	COMPT	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
25	(W)Z	iP	15 48 29		Dilatation.
25	(W)Z,Z	iP	22 24 39	79 <sup>o</sup> .3	Compression.
	(W)Z	ePcP	46	8810	H - 22:12:43.
	(W)Z	ipP	25 04		Depth: about 100 km.
	(L)E	eS	34 30		USCGS: H - 22:12:43.
	(L)N	M	55.2		Depth: about 60 km.
					52 <sup>o</sup> N., 176 <sup>o</sup> E.
					Rat Islands, Aleutian Islands.
26	(W)Z	e	03 24 46		
26	(W)Z	eP	21 55 59		
26	(W)Z	eP	23 05 04		
27	(W)Z	eP	18 12 58		
28	(W)Z,Z	eP	13 46 04	33 <sup>o</sup> .5	Dilatation.
	Z	ePP	47 25	3720	H - 13:39:21.
	(L)E	eS	51 26		USCGS: H - 13:39:17.
	(L)N	M	14 00.8		38 <sup>o</sup> N., 27 <sup>1</sup> / <sub>2</sub> <sup>o</sup> E.
					Near west coast of Turkey.
28	(W)Z,Z	ePKP	20 32 45		USCGS: H - 20:13:30.
	Z	epPKP	55		Depth: about 60 km.
	(W)Z	ePP	35 21		14 <sup>o</sup> N., 91 <sup>o</sup> W.
	(L)N	iPKS	36 10		Near coast of Guatemala.
					Mag: 6 <sup>3</sup> / <sub>4</sub> (Pas., Berk.)
28	(W)Z	ePKP	21 23 49		USCGS: H - 21:05:59.
					Depth: about 600 km.
					24 <sup>1</sup> / <sub>2</sub> <sup>o</sup> S., 179 <sup>o</sup> E.
					Fiji Islands region.
28	(W)Z,Z	eP	23 53 57	6 <sup>o</sup> .5	H - 23:52:18.
	(W)E	eS	55 13	720	
29	(W)Z,Z	ePKP	01 33 42		USCGS: H - 01:14:27.
					Depth: about 60 km.
					Near coast of Guatemala.
29	(W)Z,Z	eP	15 46 18	80 <sup>o</sup> .2	H - 15:34:04.
	(W)E	iPcP	26	8910	USCGS: H - 15:33:56.
	(L)N	eS	56 23		51 <sup>o</sup> N., 178 <sup>1</sup> / <sub>2</sub> <sup>o</sup> W.
	(L)N	eScS	35		Andreanof Islands, Aleutian Islands.
29	Z	eP	16 09 46	21 <sup>o</sup> .3	H - 16:04:55.
	N	eS	13 39	2370	(From travel time of P only).
					26 <sup>o</sup> N., 90 <sup>1</sup> / <sub>2</sub> <sup>o</sup> E. Assam.
					Felt: at Sylhet, Mymensingh and Sirajgunj.
					Chittagong: P - 16:06:00.
					USCGS: H - 16:04:54.
					Pakistan-Assam border.
29	(W)Z	ePKP	23 31 15		USCGS: H - 23:12:03.
					11 <sup>o</sup> S., 76 <sup>1</sup> / <sub>2</sub> <sup>o</sup> W.
					Peru.



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30	(W)Z	ePKP	03 49 54		USGS: H - 03:30:50. Kermadec Islands.
30	(W)Z,Z	eP	14 03 10		
30	(W)Z,Z	iP	17 44 59	61 <sup>o</sup> .9	Dilatation.
	(W)Z	ePcP	45 27	6880	H - 17:35:24.
	(W)Z,Z	epP	46 45		Depth: about 500 km.
	(W)Z	ePP	47 24		USGS: H - 17:35:20.
	(W)Z,Z	e	48 46		Depth: about 500 km.
	Z	ePPP	49 01		28 <sup>o</sup> N., 139 <sup>o</sup> E.
	(L)NE,N	iS	52 45		Bonin Islands region.
	E	e	53 23		
	(L)E	eScS	57		
	(L)N	esS	55 48		
	(L)EN	iSS	57 02		
	(L)N	e	18 00 24		
31	(W)Z,Z	eP	06 22 49		
31	(W)Z	eP	10 10 24	6 <sup>o</sup> .0	H - 10:08:52.
	(W)E	eS	11 34	670	

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GEOPHYSICAL REVIEW

Vol. I. 1955

Part I. Seismology

No. 11.

Seismological Bulletin

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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
1	(W)Z (W)Z	eP i	13 30 41 31 05		
1	(W)Z	eP	21 57 11		
1	(W)Z Z (L)N	eP epP e(S)	22 50 21 52 02 58 22		USCGS: H - 22:40:15. Depth: about 400 km. 52 $\frac{1}{2}$ $^{\circ}$ N., 153 $^{\circ}$ E. Sea of Okhotsk.
2	(W)Z,Z	eP	03 45 09		
2	(W)Z	e	19 52 10		
2	(W)Z,Z (W)Z (L)NE	eP i eS	21 23 40 52 33 13	74 $^{\circ}$ .1 8230	H - 21:12:00. USCGS: H - 21:11:56. Western New Guinea.
3	(W)Z,Z N Z (L)E Z (M)E	ePKP epPKP pPP ePKS epPKS M	12 55 26 50 58 04 54 59 11 13 47.6		USCGS: H - 12:36:20. Depth: about 100 km. 14 $^{\circ}$ N., 91 $^{\circ}$ W. Guatemala. Mag: 6 $\frac{1}{2}$ (Pas.)
3	(W)Z,Z (W)Z Z (L)E,E	iP iPcP e iScS	16 33 04 46 34 09 42 52		Dilatation. USCGS: H - 16:22:52. 1 $^{\circ}$ N., 123 $^{\circ}$ E. Celebes.
3	(W)Z (W)Z	e e	17 01 42 02 14		
3	(W)Z,Z (W)E	eP eS	21 54 04 56 09	11 $^{\circ}$ .0 1220	H - 21:51:23.
4	Z	e	06 57 50		
4	(W)Z Z Z Z (L)E E (L)E (L)N (L)N	ePKP e epPKP ePP epPP eSKP ePSKS eSS esSS	11 48 58 49 05 31 52 03 32 47 12 02 10 10 19 11 01	141 $^{\circ}$ .1 15680	H - 11:29:41. Depth: about 100 km. USCGS: H - 11:29:40. Depth: about 100 km. 29 $^{\circ}$ S., 69 $^{\circ}$ W. Northern Chile.
4	(W)Z (W)Z (L)E (L)N (L)E	eP e eS eScS eL	19 19 51 20 04 28 12 29 39 38.0	61 $^{\circ}$ .5 6830	H - 19:09:30. USCGS: H - 19:09:30. 43 $^{\circ}$ N., 145 $^{\circ}$ E. Hokkaido, Japan.
4	(W)Z (L)E (L)N	eP eS eL	22 21 02 27 38 33.8	44 $^{\circ}$ .5 4940	H - 22:12:47. USCGS: H - 22:12:45. 1 $\frac{1}{2}$ $^{\circ}$ N., 31 $^{\circ}$ E. Belgian Congo-Uganda border.



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5	(L)N	M	03 02.4		USCGS: H - 02:01:15. 37 $\frac{1}{2}$ $^{\circ}$ N., 122 $^{\circ}$ W. Santa Clara County, California. Mag: 5.8 (Pas.)
5	(W)Z (W)N	iP iS	06 44 04.8 12.7		Compression.
5	(W)Z,Z	ePKP	07 18 32		Dilatation. USCGS: H - 07:00:35. Depth: about 550 km. 24 $^{\circ}$ S., 180. South of Fiji Islands.
5	Z	e	16 48 44		
5	(W)Z,Z Z	iP e	17 23 01 12		Dilatation. USCGS: H - 17:13:24. Depth: about 600 km. 7 $^{\circ}$ S., 120 $\frac{1}{2}$ $^{\circ}$ E. Flores Sea.
6	(W)Z	eP	09 30 06		USCGS: H - 09:20:30. Depth: about 550 km. 28 $^{\circ}$ N., 139 $^{\circ}$ E. Bonin Islands region.
6	(W)Z	eP	21 11 17		USCGS: H - 20:58:47. 53 $\frac{1}{2}$ $^{\circ}$ N., 166 $^{\circ}$ W. Fox Islands, Aleutian Islands.
6	(W)Z	e	22 27 26		
7	(W)Z,Z (L)NE E (L)N (L)E (L)N	eP ePP ePPP iS iSS iL	03 25 53 26 56 27 18 31 04 32 58 35.0	31 $^{\circ}$ .9 3540	H - 03:19:24. USCGS: H - 03:19:21. 2 $^{\circ}$ S., 68 $^{\circ}$ E. Chagos Islands region.
7	(W)Z (W)N	eP iS	18 52 13.5 37.1	1 $^{\circ}$ .8 200	H - 18:51:41.
8	(W)Z Z (L)E (L)EN, (M)E (L)E (L)N	ePKP ePP eSKS iPS eSS iL	02 21 56 22 56 28 55 32 36 38 45 51.6	114 $^{\circ}$ .3 12700	H - 02:03:14. USCGS: H - 02:03:15. Sandwich Islands region. Mag: 6 $\frac{3}{4}$ - 7 (Pas.)
8	(W)Z,Z (M)E,E	eP e	03 40 28 51 00		USCGS: H - 03:27:14. 7 $^{\circ}$ S., 155 $\frac{1}{2}$ $^{\circ}$ E. Solomon Islands.
8	(W)Z Z Z	eP i iP	04 50 47 51 12 25		USCGS: H - 04:45:26. Depth: about 150 km. 25 $^{\circ}$ N., 95 $^{\circ}$ E. Northern Burma.



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			h.	m.	s.		
8	(W)Z,Z (L)N (L)N	eP eS eL	11	05	01 10 02 14.3	30 <sup>o</sup> .5 3390	H - 10:58:44.
8	(W)Z,Z	eP	11	10	15		USCGS: H - 10:59:15. 53 <sup>1</sup> / <sub>2</sub> ° N., 160° E. Near east coast of Kamchatka.
8	(W)Z	ePKP	17	11	48		USCGS: H - 16:53:15. Depth: about 250 km. 19° S., 176 <sup>1</sup> / <sub>2</sub> ° W. Tonga Islands.
9	(W)Z	e	03	20	58		
9	(W)Z,Z (W)Z,Z Z (L)E (L)N (L)N (L)N	iP ipP isP ePP iS iSS iL	09	50	16 27 30 52 03 56 51 10 00 12 03.9	44 <sup>o</sup> .9 4990	Compression. H - 09:42:03. Depth: normal. USCGS: H - 09:41:57. 2° S., 100° E. Near south coast of Sumatra. Mag: 6 <sup>1</sup> / <sub>4</sub> - 6 <sup>1</sup> / <sub>2</sub> (Pas.)
9	(W)Z,Z (L)N (L)E (L)N	eP eS ePS eL	16	34	24 45 20 46 33 17 01.6	91 <sup>o</sup> .0 10110	H - 16:21:17. USCGS: H - 16:21:12. 7° S., 155° E. Solomon Islands.
9	(W)Z	eP	21	49	(37)		
10	(W)Z	iP	01	16	03		Dilatation.
10	(W)Z	iP	05	50	53		Dilatation.
10	(W)Z,Z (L)N (L)N	eP iS eL	06	05	36 14 58 29.3	72 <sup>o</sup> .1 8010	H - 05:54:08. USCGS: H - 05:54:08. 54 <sup>1</sup> / <sub>2</sub> ° N., 169° E. Komandorski Islands.
10	(W)Z,Z	eP	09	41	45		Dilatation. USCGS: H - 09:29:15. 50 <sup>1</sup> / <sub>2</sub> ° N., 173 <sup>1</sup> / <sub>2</sub> ° W. Andreanof Islands, Aleutian Islands.
10	(W)Z,Z (L)N (L)N	eP eS eL	21	14	20 22 09 29.0	56 <sup>o</sup> .2 6240	Compression. H - 21:04:36. USCGS: H - 21:04:40. 10° N., 123° E. Negros Island, P.I.
11	(W)Z	ePKP	02	09	27		USCGS: H - 01:49:57. Peru - Ecuador border.
11	(W)Z	e	09	12	57		
11	(W)Z,Z	iP	12	10	53		Compression.



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
11	(W)Z,Z (L)E (M)E (M)E	iP iS iS eL	12 26 20 51 26 52 11 05.8	72°.7 8980	Dilatation. USCGS: H - 12:15:58. 31½° N., 140° E. Off south coast of Honshu, Japan.
11	(W)Z,Z (W)E	iP iS	16 20 34 21 51	6°.5 720	Dilatation. H - 16:18:55.
11	(W)Z (L)E (L)N	eP eSKS iS	18 07 41 18 15 40	91°.7 10190	H - 17:54:30. USCGS: H - 17:54:28. 7° S., 155° E. Solomon Islands.
11	(W)Z,Z E E	eP eSKS eS	18 17 28 28 01 27	91°.7 10190	Compression. H - 18:04:17. USCGS: H - 18:04:16. 7° S., 155° E. Solomon Islands.
11	(W)Z,Z (L)N (L)N	eP e(S) eL	23 34 40 38 54 43.1		USCGS: H - 23:29:36. 34° N., 93½° E. Chinghi Province, China.
12	Z	eP	01 54 58		Dilatation.
12	Z (L)E, (M)E (L)E, (M)E (M)E (M)E	iP iPP iS i eL	06 15 47 16 51 20 53 21 33 24.9	31°.2 3470	Dilatation. H - 06:09:24. USCGS: H - 06:09:20. 31½° N., 30° E. Off coast of Egypt. Mag: 6¼ (Pas.)
12	Z (L)N	iP iS	13 29 52.4 30 23.4	2°.4 270	Compression. H - 13:29:11.
13	(W)Z,Z Z (L)NE (L)N	iP epP iS eL	02 13 00 12 23 06 41.8	81°.7 9080	Compression. H - 02:00:47. Depth: about 60 km. USCGS: H - 02:00:43. Depth: about 60 km. 52° N., 176° W. Andreanof Islands, Aleutian Islands. Mag: 5¼ - 6 (Pas.)
13	(W)Z,Z (L)E (L)E	eP eS eL	17 12 01 22 06 38.2	80°.2 8910	H - 16:59:47. USCGS: H - 16:59:52. 45° S., 96½° E. South Indian Ocean.
13	(W)Z,Z (W)Z,Z	eP i	17 47 07 08		USCGS: H - 17:36:41. ½° N., 125° E. Near coast of Celebes.
14	(W)Z	e	17 41 47		USCGS: H - 17:32:10. Laptev Sea. 300 miles north of Taimyr Peninsula.



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
15	(W)Z,Z (W)Z,Z (L)E (M)E (M)E	iP iPcP iS iScS eL	12 42 01 19 51 26 52 11 05.3	72 <sup>o</sup> .7 8080	Dilatation. H - 12:30:29. USCGS: H - 12:30:27. 5 <sup>o</sup> S., 134 $\frac{1}{2}$ <sup>o</sup> E. Off coast of western New Guinea. Mag: 6 $\frac{3}{4}$ (Pas.)
16	(W)Z,Z	ePKP	04 48 09		USCGS: H - 04:30:00. Depth: about 400 km. 15 <sup>o</sup> S., 177 $\frac{1}{2}$ <sup>o</sup> W. Fiji Islands region.
16	(W)Z,Z	ePKP	05 01 28		USCGS: H - 04:42:30. 30 <sup>o</sup> S., 178 $\frac{1}{2}$ <sup>o</sup> W. Kermadec Islands.
16	(W)Z	eP	18 41 53		Dilatation. H - 18:21:15. USCGS: H - 20:21:15. 27 $\frac{1}{2}$ <sup>o</sup> N., 90 <sup>o</sup> E.
16	(W)Z	e	21 03 33		
16	(W)Z	i	23 37 20		Dilatation.
17	(W)Z	e	02 17 59		
17	(W)Z (L)E, (W)E,E (L)N	eP i iS	05 47 14.0 28.0 45.5	2 <sup>o</sup> .4 270	H - 05:46:33. New Hebrides Islands.
17	(W)Z (W)E	eP eS	06 50 51 52(55)		Dilatation. USCGS: H - 07:11:52. 14 <sup>o</sup> S., 142 <sup>o</sup> W. Atlantic Ocean.
17	(W)Z	e	07 41 17		
17	(W)Z	ePKP	12 14 01		USCGS: H - 11:55:26. 17 $\frac{1}{2}$ <sup>o</sup> S., 168 $\frac{1}{2}$ <sup>o</sup> E. New Hebrides Islands.
17	(W)Z (W)E	eP eS	13 46 58 48 59	10 <sup>o</sup> .6 1180	H - 13:44:22. Kermadec Islands.
17	(W)Z	e	18 16 38		H - 20:55:45.
17	(W)Z	ePKP	20 15 48		USCGS: H - 19:56:46. 32 <sup>o</sup> S., 178 <sup>o</sup> W. Kermadec Islands. Himarak Sea.
18	(W)Z	e	09 24 37		
18	(W)Z,Z Z (L)E	iP epP iS	11 40 47 43 15 47 22	51 <sup>o</sup> .3 5700	Dilatation. H - 11:32:35. Depth: about 600 km. USCGS: H - 11:32:32. Depth: about 600 km. 39 <sup>o</sup> N., 129 <sup>o</sup> E. Off east coast of Korea.
19	(W)Z (W)Z,Z (L)E	eP i eL	04 20 31 11 26 33 41.2		USCGS: H - 04:11:03. 26 $\frac{1}{2}$ <sup>o</sup> N., 129 <sup>o</sup> E. Ryukyu Islands.



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			h.	m.	s.		
19	(W)Z (W)E	eP e(S)	19	45	06 47 11		
19	(W)Z, Z	e	20	31	24		
20	(W)Z	e	00	26	10		
20	(W)Z, Z	e	06	07	06		
20	(W)Z, Z (L)N (L)E, (M)E	ePKP ePP e	13	39	24 41 20 51 11		Dilatation. USCGS: H - 13:20:19. 32° S., 178° W. Kermadec Islands. Mag: 6½ (Pas.), (Berk).
20	(W)Z	e	17	18	09		
20	(W)Z, Z (W)E	eP eS	20	25	52 29 31	19°.9 2210	Dilatation. H - 20:21:16. USCGS: H - 20:21:13. 27½° N., 90° E. Bhutan.
20	(W)Z	e	23	07	51		
21	(W)Z, Z	ePKP	06	57	59		USCGS: H - 06:39:38. 17½° S., 169° E. New Hebrides Islands.
21	(W)Z, Z	eP	07	24	55		Dilatation. USCGS: H - 07:11:52. 14° S., 14½° W. Atlantic Ocean.
21	(W)Z	e	08	09	06		USCGS: H - 07:50:06. 27° N., 112° W. Baja California.
21	(W)Z	ePKP	13	47	40		USCGS: H - 13:28:35. 32° S., 178½° W. Kermadec Islands.
21	(W)Z (L)E	eP eS	20	58	33 21 02 24	21°.1 2340	H - 20:53:45.
21	(W)Z	eP	22	55	36		USCGS: H - 22:42:55. 6° S., 148° E. Bismarck Sea.
22	(W)Z, Z N (M)E	eP iS e	03	33	59 41 07 45 02	49°.6 5510	Dilatation. H - 03:25:04. USCGS: H - 03:25:03. 24° N., 123° E. Off east coast of Formosa.
22	(W)Z	e	05	08	54		
22	(W)Z	e	05	47	07		USCGS: H - 05:34:26. New Britain.
22	(W)Z	e	11	26	27		



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23	(W)Z (W)Z (L)E	eP iP eS	15 12 35 37 17 33		Dilatation. H - 15:06:22. (From travel times of P onl; 27° N., 101½° E. Southern China. Lahore ; P - 15:11:39. Chittagong: P - 15:08:47. USCGS: H - 15:06:19. 27° N., 101½° E. Yunnan Province, China. Mag: 6½ (Pas.)
23	(W)Z	eP	17 58 23		USCGS: H - 17:52:13. Sikang Province.
23	(W)Z	eP	19 25 49		
23	(W)Z	e	19 35 57		USCGS: H - 19:17:29. New Hebrides Islands.
24	(W)Z,Z (L)N	ePKP ePPS	02 19 49 33 06	124° .6 13840	H - 02:00:47. USCGS: H - 02:00:45. 32° S., 178° W. Kermadec Islands.
24	(W)Z,Z Z (L)N (L)N	iP iPP iS iSS	10 30 20 32 16 37 26 41 02	49° .3 5480	Compression. H - 10:21:28. USCGS: H - 10:21:29. 22° N., 122° E. Off east coast of Formosa.
24	(W)Z (W)Z,Z (W)E	eP iP iS	10 37 20 22 39 29	11° .4 1270	H - 10:34:33.
24	(W)Z,Z Z	ePKP epPKP	17 10 08 37		USCGS: H - 16:50:45. Depth: about 100 km. 23° S., 68° W. Northern Chile.
24	(W)Z	e	20 04 44		USCGS: H - 19:51:43. Solomon Islands.
25	(W)Z,Z	iP	08 40 40		Compression. USCGS: H - 08:35:52. 43° N., 46° E. Southern Russia.
25	(W)Z (W)E	eP eS	08 41(31.9) 42(36.1)		Felt Northern West Pakistan.
25	(W)Z	ePKP	11 54 02		USCGS: H - 11:34:57. Tonga Islands region.
25	(W)Z,Z E	iP eS	18 21 56 22 26	2° .4 270	Compression. H - 18:21:15.



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			h.	m.	s.		
25	(W)Z	eP	19	09	33	61 <sup>0</sup> .5 6830	H - 18:59:24.
	Z	ipP			50		Depth: about 100 km.
	(L)N	iS		17	45		USCGS: H - 18:59:22.
	(L)E	isS		18	25		Depth: about 100 km.
	(L)E	iScS		19	20		6 <sup>0</sup> N., 127 <sup>1</sup> / <sub>2</sub> E.
	Z	eP'P'		38	58		Off east coast of Mindanao, Philippine Islands.
						Mag: 6 <sup>1</sup> / <sub>2</sub> (Pas.)	
26	(W)Z	ePKP	08	47	11		USCGS: H - 08:28:20.
	(W)Z	e			16		Depth: about 200 km.
	(W)Z,Z	i			19		15 <sup>1</sup> / <sub>2</sub> N., 92 <sup>1</sup> / <sub>2</sub> W.
	Z	ePP		49	26		Chiapas, Mexico.
	Z,N	iPKS		50	22		Mag: 6 <sup>3</sup> / <sub>4</sub> (Pas.)
28	Z	eP	01	52	54	30 <sup>0</sup> .5 3390	H - 01:46:37.
	(L)E	eS		57	55		USCGS: H - 01:46:36.
	(L)N	e		59	00		27 <sup>0</sup> N., 101 <sup>1</sup> / <sub>2</sub> E. Yunnan Province, China.
28	Z	eP	04	32	00	49 <sup>0</sup> .3 5480	H - 04:23:08.
	(L)N	iS		39	06		USCGS: H - 04:21:43. Celebes Sea.
28	(W)Z	e	18	28	51		USCGS: H - 18:09:40.
	(W)Z,Z	e			56		15 <sup>0</sup> N., 97 <sup>1</sup> / <sub>2</sub> W.
	(L)N	iPKS		32	26		Near coast of Oaxaca, Mexico. Mag: 6 (Pas.)
28	(W)Z,Z	eP	19	59	09		USCGS: H - 19:47:47. 20 <sup>0</sup> N., 146 <sup>0</sup> E. Marianas Islands.
28	(W)Z,Z	iP	23	14	00	7 <sup>0</sup> .2 800	Dilatation.
	(W)E	iS		15	23		H - 23:12:11.
29	(W)Z,Z	eP	11	42	53		Compression. USCGS: H - 11:30:33. 51 <sup>1</sup> / <sub>2</sub> N., 176 <sup>0</sup> W. Andreanof Islands, Aleutian Islands.
29	(W)Z	eP	13	04	40		USCGS: H - 12:58:29.
	(L)N	e		10	50		28 <sup>0</sup> N., 101 <sup>0</sup> E. Sikang Province, China.
29	(W)Z,Z	iP	20	08	22	60 <sup>0</sup> .5 6720	Dilatation.
	Z	ipP			58		H - 19:58:27.
	(L)NE	eS		16	23		Depth: about 150 km.
	(L)N	isS		17	12		USCGS: H - 19:58:27. Depth: about 150 km. 40 <sup>0</sup> N., 141 <sup>0</sup> E. Northern Honshu, Japan.
30	(W)Z	eP	03	18	53	59 <sup>0</sup> .0 6550	H - 03:08:49.
	(L)N	eS		26	59		USCGS: H - 03:08:46. 8 <sup>0</sup> N., 126 <sup>1</sup> / <sub>2</sub> E. Mindanao foreshock.



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DATE	COMPT.	PHASE	GMT		$\Delta$ km.	REMARKS
			h.	m. s.		
30	(W)Z,Z	eP	03	34 31		Compression. USCGS: H - 03:22:12. Andreanof Islands, Aleutian Islands.
30	(W)Z	e	03	48 36		USCGS: H - 03:42:17. Sikang Province, China.
30	(W)Z,Z (L)E (L)N	i iPP eS	07	11 40 13 44 19 38		USCGS: H - 07:01:22. 7 $\frac{1}{2}$ <sup>o</sup> N., 126 $\frac{1}{2}$ <sup>o</sup> E. Near east coast of Mindanao.
30	(W)Z,Z	eP	13	59 59		Compression. USCGS: H - 13:47:37. 51 $\frac{1}{2}$ <sup>o</sup> N., 176 $\frac{1}{2}$ <sup>o</sup> W. Andreanof Islands foreshock.
30	(W)Z,Z (L)NE	eP iS	15	08 31 12 22	21 <sup>o</sup> .1 2340	H - 15:03:43.
30	(W)Z	e	16	01 23		
30	(W)Z	e	17	29 20		
30	(W)Z,Z (L)N	iP eS	19	26 47 37 01	82 <sup>o</sup> .0 9110	Compression. H - 19:14:24.. USCGS: H - 19:14:24. 51 $\frac{1}{2}$ <sup>o</sup> N., 176 $\frac{1}{2}$ <sup>o</sup> W. Andreanof Islands, Aleutian Islands.
30	(W)Z	e	19	34 29		
30	(W)Z	eP	20	09 14		
30	(W)Z	e	20	21 29		
30	(W)Z	eP	20	34 38		
30	(W)Z	eP	20	57 28		
30	(W)Z	e	22	24 53		
30	(W)Z	e	22	37 24		

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GEOPHYSICAL REVIEW

Vol. I. 1955

Part I. Seismology

No. 12.

Seismological Bulletin

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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
1	(W)Z,Z	eP	00 24 01		USCGS: H - 00:12:29. 53 $\frac{1}{2}$ $^{\circ}$ N , 170 $^{\circ}$ E. Komandorskie Islands region.
1	(W)Z,Z	eP	06 56 03	29 $^{\circ}$ .6	H - 06:29:54.
	(L)N	eS	40 58	3290	USCGS: H - 06:29:54.
	(L)E	iS	41 02		30 $^{\circ}$ N ; 101 $^{\circ}$ E.
	(L)E	iL	43.3		Sikang Province, China.
1	(W)Z,Z	eP	10 32 46		USCGS: H - 10:22:53. 41 $^{\circ}$ N , 141 $^{\circ}$ E. Tsugaru Strait, Japan.
1	(W)Z	e	14 56 47		
1	(W)Z	ePKP	19 07 21		USCGS: H - 18:49:10. 19 $^{\circ}$ S , 169 $^{\circ}$ E. New Hebrides Islands.
1	(W)Z	e	19 23 46		
1	(W)Z	eP	21 06 56		
	(W)E	eS	08 27		
1	(W)Z,Z	eP	23 16 43		
2	(W)Z,Z	eP	03 26 00		USCGS: H - 03:13:40. Andreanof Islands, Aleutian Islands.
2	(W)Z	eP	20 31 26		
3	(W)Z,Z	eP	17 52 36		USCGS: H - 17:40:00. 56 $^{\circ}$ N , 162 $^{\circ}$ W. Alaska Peninsula.
3	(W)Z,Z	eP	18 17 15	30 $^{\circ}$ .3	H - 18:11:00.
	(L)E	eS	22 15	3370	
3	(W)Z,Z	eP	18 34 15		
4	(W)Z,Z	e	01 21 17		
4	(W)Z	ePKP	07 46 01		USCGS: H - 07:26:57. Tonga Islands region.
4	(W)Z	e	20 59 39		
5	(W)Z	ePKP	01 05 17		USCGS: H - 00:46:42. Depth: about 200 km. 23 $\frac{1}{2}$ $^{\circ}$ S , 178 $^{\circ}$ W. Tonga Islands region.
5	(W)Z	e	01 50 05		
5	(W)Z	e	04 33(43)		



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DATE	COMPT.	PHASE	GMT			$\Delta$ km.	REMARKS
			h.	m.	s.		
5	(W)Z,Z	eP	09	08	57	67 <sup>o</sup> .7	H - 08:57:56. USOGS: H - 08:57:55. 53 $\frac{1}{2}$ <sup>o</sup> N, 161 <sup>o</sup> E. Near east coast of Kamchatka.
	(W)Z	i		09	55	7520	
	(L)E	eS		17	54		
	(L)E	eScS		18	50		
	(L)E	iL		34.2			
5	(W)Z	e	17	25	59		
6	(W)Z	e	00	30	35		
6	(W)Z	e	11	08	47		USOGS: H - 10:55:38. North Atlantic Ocean.
6	(W)Z,Z	ePKP	11	22	32	144 <sup>o</sup> .7	H - 11:05:14. Depth: about 150 km. Using Gutenberg Tables. USOGS: H - 11:05:16. Depth: about 150 km. 36 <sup>o</sup> S, 70 <sup>o</sup> W. Mendoza Province, Argentina. Mag: 6 $\frac{1}{2}$ (Pas.)
	Z	ipPKP		23	15	16080	
	(M)E, (L)E,	e		25	50		
	(W)Z,Z						
	(W)Z,Z	iPP			57		
	(L)N	iSKP		26	02		
	(L)E	eSKKS		31	55		
	NE, (L)NE	i		32	29		
	(L)N	e		36	05		
	(L)E	iPPS		38	44		
	(L)E	iSS		44	21		
6	(W)Z	e	19	28	18		
7	(W)E	e	08	02	10		
7	(W)Z,Z	eP	11	58	45		
8	(W)Z	ePKP	21	24(22)			USOGS: H - 21:05:32. Fiji Islands.
9	(W)Z	iP	01	21	53		Compression.
	(W)Z	e		22	19		
9	(W)Z	e	08	22(00)			
9	(W)Z	e	10	05	55		
9	(W)Z,Z	eP	15	02	54		USOGS: H - 12:50:50. 2 <sup>o</sup> S, 12 $\frac{1}{2}$ <sup>o</sup> W. Mid-Atlantic Ocean.
9	(W)Z	e	14	08	30		
9	(W)E,Z	iP	17	53	07	89 <sup>o</sup> .1	H - 17:40:09. USOGS: H - 17:40:09. 5 <sup>o</sup> S, 153 <sup>o</sup> E. New Britain.
	N	e		55	19	9900	
	(M)E	eSKS		18	05	58	
	(L)N	i			50		
	(M)E	eS			55		
	(M)E, (L)E	iPPS		05	22		
	(L)N	eL		21.5			
9	(W)Z,Z	eP	23	25	45	80 <sup>o</sup> .6	H - 23:13:29. USOGS: H - 23:13:52. 50 $\frac{1}{2}$ <sup>o</sup> N, 176 <sup>o</sup> E. Near Islands, Aleutian Islands.
	(L)N	e		35	59	8950	
	(L)E	eS			52		
	(L)E	iL		55.7			



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
10	(W)Z	eP	00 11 39		
10	(W)Z	e	00 29 25		
10	(W)Z	eP	01 27 40		USCGS: H - 01:17:26. 41 $\frac{1}{2}$ <sup>o</sup> N, 143 <sup>o</sup> E. Near south coast of Hokkaido, Japan.
10	(W)Z	e	05 21 47		
10	(W)Z,Z (W)Z E,N (L)N (W)Z,Z	eP i iSKS eS eP'P'	09 10 39 13 24 21 15 27 36 36	89 <sup>o</sup> .1 9900	H - 08:57:41. USCGS: H - 08:57:44. 5 <sup>o</sup> S, 153 <sup>o</sup> E. New Britain. Mag: 7 $\frac{1}{4}$ (Pas.)
10	(W)Z	i	09 24 40		Dilatation.
10	(W)Z	e	09 46 50		Dilatation.
10	(W)Z	e	10 14 36		
10	(W)Z	e	10 19 31		
10	(W)Z	e	11 44 14		
10	(W)Z	eP	12 05 32		USCGS: H - 11:52:32. New Britain.
10	(W)Z	e	12 20 11		
10	(W)Z	e	12 24 18		
10	(W)Z	e	14 15 03		
10	(W)Z	e	19 27 43		
10	(W)Z	e	20 45 05		
10	(W)Z,Z	e	22 07 04		
10	(W)Z,Z (W)Z	eP epP	23 13 41 14 05		USCGS: H - 23:03:41. Depth: about 100 km. 39 <sup>o</sup> N, 140 $\frac{1}{2}$ <sup>o</sup> E. Northern Honshu, Japan.
11	(W)Z,Z	eP	01 24 49		USCGS: H - 01:14:27. Northern Celebes.
11	(W)Z	e	02 08(05)		
11	(W)Z (L)N (L)N	eP eS eL	04 19 06 26 26 35.7	51 <sup>o</sup> .5 5720	H - 04:09:57. USCGS: H - 04:10:00. Indian Ocean, 700 miles east of Mascarene Islands.
11	(W)Z,Z	iP	13 36 18		Compression.
11	(W)Z,Z	eP	17 31 25		
11	(W)Z	e	19 40 25		



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DATE	COMPT.	PHASE	GMT			$\Delta$ km.	REMARKS
			h.	m.	s.		
11	(W)Z	e	21	11	25		
12	(W)Z	eP	00	08	31		
12	(W)Z	e	06	25	18		
12	(W)Z	e	19	16	55		
13	(W)Z	e	00	11	(30)		
13	(W)Z,Z	eP	09	40	23	98 <sup>o</sup> .7	H - 09:26:41.
	(W)Z	ePP	44	22		10970	USCGS: H - 09:26:44.
	(M)E	e	50	49			9 $\frac{1}{2}$ <sup>o</sup> S, 161 <sup>o</sup> E.
	(M)E, (L)E	1SKS	51	02			Solomon Islands.
	(L)E	1S		50			Mag: 7 (Pas.)
	(L)N	1SS	58	52			
	Z	eP'P'	10	05	12		
13	(W)Z	ePKP	16	38	(36)		USCGS: H - 16:19:51.
	E	e	40	29			Depth: about 200 km. 36 <sup>o</sup> S, 177 $\frac{1}{2}$ <sup>o</sup> E. Off coast of North Island, New Zealand.
13	(W)Z,Z	1P	17	59	04	48 <sup>o</sup> .5	H - 17:50:18.
	(L)E	1PP	18	01	01	5390	USCGS: H - 17:50:16.
	(L)N	eS	06	05			24 <sup>o</sup> N, 121 <sup>o</sup> E.
	(L)E	1L	18.8				Formosa.
13	(W)Z,Z	ePKP	22	10	13		USCGS: H - 21:50:59. 12 <sup>o</sup> N, 87 <sup>o</sup> W. Near coast of Nicaragua.
14	(W)Z,Z	1P	06	03	06.1	6 <sup>o</sup> .0	Dilatation.
	(W)E	1S	04	16.3		670	H - 06:01:34.
14	Z	ePKP	09	02	50		USCGS: H - 08:43:00.
	(L)EN	i	06	08			3 <sup>o</sup> S, 103 $\frac{1}{2}$ <sup>o</sup> W.
	(L)EN	ePKS		18			Pacific Ocean,
	(L)E	e	13	16			West of Galapagos Islands.
	(L)N	e	17	31			Mag: 6 - 6 $\frac{1}{4}$ (Pas.)
	(L)E	ePPS	19	45			
	(L)E	eSS	26	08			
14	(W)Z	e	13	29	41		
14	(W)Z	e	15	50	(17)		
15	(W)Z,Z	1P	21	40	33		Dilatation.
16	(W)Z,Z	eP	04	49	15		USCGS: H - 04:41:23. Farquhar Islands, 300 miles north of Madagascar.
16	(W)Z	eP	10	53	(28)		
16	(W)Z	eP	17	27	29		USCGS: H - 17:16:38. Depth: about 60 km. Near south coast of Kamchatka.
16	(W)Z	e	19	30	35		



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			h.	m.	s.		
17	(W)Z (W)Z	eP i	01	21	13 38		USCGS: H - 01:08:07. 6° S, 154° E. Solomon Islands.
17	(W)Z,Z	iP	05	26	39		Dilatation.
17	(W)Z	e	08	50	16		
17	(W)Z	e	17	33	(52)		
17	(W)Z,Z (W)Z,Z(L)E (L)N (L)E (L)E	eP i eS iS iSSS	20	14	20 25 18 46 50 20 12	25°.5 2830	H - 20:08:49. USCGS: H - 20:08:54. 17½° N, 43½° E. Southern Saudi Arabia.
17	(W)Z	e	20	31	50		
17	(W)Z	e	23	30	38		
18	(W)Z,Z (W)Z,Z	e i	01	14	10 15 54		
18	(W)Z,Z	eP	01	23	07		
18	(W)Z,Z	eP	01	46	35		
18	(W)Z (L)E (L)E	eP eSS iSSS	15	37	48 42 37 57		USCGS: H - 15:32:47. Eastern Tibet.
19	(W)Z,Z (M)E,NE	eP eS	01	55	32 02 03 40	59°.3 6590	H - 01:45:26. USCGS: H - 01:45:26. 40° N, 139½° E. Northern Honshu, Japan.
19	Z (W)Z,Z (L)N (L)E Z	eP iPoP iS e eP'P'	10	05	38 06 09 14 26 19 45 34 16	66°.1 7340	H - 09:54:47. USCGS: H - 09:54:43. 49½° N, 155° E. Northern Kurile Islands. Mag: 6½ (Pas.)
19	(W)Z,Z	e	11	52	28		
19	(W)Z	e	17	10	42		
19	(W)Z (W)E	eP e(S)	18	19	14 21 09		
19	(W)Z (L)E	eP eL	20	47	27 21 14.1		USCGS: H - 20:36:30. Northern Kurile Islands.
19	(W)Z	e	21	24	(56)		
20	(W)Z (L)N (L)E	ePKP e e	01	52	14 02 03 43 10 10		USCGS: H - 01:33:30. South Atlantic Ocean, about 300 miles north of South Georgia Island.



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20	(W)Z,Z	eP	03 55 13	76°.4	H - 03:43:20. 8490
	(L)N	eS	04 04 58		
	(L)E	iSoS	05 14		
	(L)E	e	10 15		
20	(W)Z	eP	07 39 02		USCGS: H - 07:27:58. 52½° N, 159° E. Near coast of Kamchatka.
20	(W)Z,Z	eP	12 05 51		
	(L)E	e(S)	15 56		
20	(W)Z	e	15 20 50		
20	(W)Z	eP	21 02 52	21°.4	H - 20:58:01. 2380
	(L)N	iS	06 45		
21	(W)Z	e	00 44(19)		
21	(W)Z,Z	iP	04 39 20	36°.6	Compression. H - 04:32:10. USCGS: H - 04:32:03. 4° N, 95° E. Near coast of Sumatra.
	N	i	40 01	4070	
	E	iPP	45		
	(L)N,(M)E	iS	45 03		
	(L)E	i	47 51		
	(L)N	iSSS	48 06		
21	(W)Z	e	18 45 54		
21	(W)Z	e	19 17(00)		
21	(W)Z,Z	iPKP	19 20 25	119°.6	Dilatation. H - 19:02:41. Depth: about 650 km. USCGS: H - 19:02:40. Depth: about 650 km. 21° S, 179° W. Fiji Islands. Mag: 6¼ (Pas.)
	(M)E,(L)E	ePP	22 02	13290	
	(W)Z	iPKP	57		
	(L)E	e	24 19		
	(L)E	eSKS	26 30		
	(L)E	i	27 59		
	(W)Z	iPKP	30 35		
	(L)E	iSP	56		
	(L)E	i	32 21		
	(L)E	i	36 28		
	(L)N	iSS	37 36		
21	(W)Z	eP	23 19 57	61°.9	H - 23:09:34. USCGS: H - 23:09:38. ½° S, 123½° E. Northern Celebes.
	(W)Z	i	20 03	6880	
	(L)E	i	24 12		
	(L)N	iS	28 20		
	(W)Z	eP'P'	49 23		
21	(W)Z	e	23 36(51)		
21	(W)Z	e	23 49(03)		
22	(W)Z	e	06 07(10)		
22	(W)Z	eP	10 20 02		USCGS: H - 10:09:20. 46° N, 156° E. Kurile Islands.
22	(W)Z	eP	11 28 47		USCGS: H - 11:18:22. Celebes aftershock.



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22	(W)Z	eP	12 53 49		USCGS: H - 12:43:30. 0° , 123° E. Celebes aftershock.
22	(W)Z (L)N (L)E	eP eScS e	22 19 21 30 00 31 02		USCGS: H - 22:06:56. 6° S , 149° E. New Britain.
23	(W)Z	e	00 38 53		
23	(W)Z	e	01 21 29		
24	Z Z	iP e	00 32 36 33 49		Dilatation. USCGS: H - 00:19:52. 4½° S , 150° E. Off coast of New Britain.
24	(W)Z	e	03 46 10		
24	(W)Z	iPKP	05 22 27		Compression. USCGS: H - 05:03:34. Kermadec Islands.
24	(W)Z	e	12 01 38		
24	(W)Z	e	12 17 41		
24	(W)Z	e	18 14(47)		
25	(W)Z	eP	07 20 31		
25	(W)Z,Z (L)N (L)N (L)N (L)N (L)E (L)N	ePKP ePP iPKS e i iPS eSSP	16 53 55 55 47 57 02 17 00 22 05 18 06 00 13 36	130°.4 14490	H - 16:34:22. USCGS: H - 16:34:23. 16½° N , 95½° W. Oaxaca, Mexico.
25	(W)Z	e	20 59(28)		
25	(W)Z,Z	e	21 13(40)		
26	(W)Z	eP	00 56 54		
26	(W)Z	e	04 38 35		
26	(W)Z,Z	eP	11 21 28		USCGS: H - 11:12:39. 24½° N , 122½° E. Near east coast of Formosa.
26	(W)Z,Z	e	11 23 54		
26	(W)Z	e	19 49 33		
26	(W)Z	e	20 36(01)		
27	(W)Z,Z Z (W)Z,Z	iP ipP isP	00 16 10 39 47		Dilatation. USCGS: H - 00:04:10. Depth: about 100 km. 52°N, 179½°W. Andreanof Islands, Aleutian Islands.



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27	(W)Z	eP	03 45(22)		USCGS: H - 03:34:17. 49° N , 157½° E. Kurile Islands region.
27	(W)Z	eP	12 01 45		USCGS: H - 11:50:40. 52½° N , 159½° E. Off east coast of Kamchatka.
27	(W)Z	eP	12 39 26		
27	(W)Z	e	17 12 39		
28	(W)Z	eP	01 35 49		
28	(W)Z	e	09 39 35		
28	(W)Z	e	23 52(35)		
29	(W)Z	e	00 51 32		
29	(W)Z,Z	eP	02 30 18		
29	Z	e	02 31 57		
29	(W)Z	e	02 39 05		
29	(W)Z	e	13 33 08		
29	(W)Z	e	14 24 19		
29	(W)Z,Z	eP	21 07 13		USCGS: H - 20:56:07. 54½° N , 161½° E. Near east coast of Kamchatka.
30	(W)Z,Z	ePKP	02 20 35		USCGS: H - 02:01:39. 29½° S , 178½° W. Kermadec Islands.
30	(W)Z,Z	eP	11 45 00	61° .5	H - 11:34:39.
	(L)E	e	49 21	6830	USCGS: H - 11:34:40.
	(L)N	eS	53 21		½° S , 123½° E.
	(L)N	e	12 00 18		Northern Celebes.
30	(W)Z	e	17 59(22)		
30	(W)Z,Z	1PKP	19 38 31		Dilatation. USCGS: H - 19:20:50. Depth: about 650 km. 19° S , 180°. Fiji Islands.
30	(W)Z	eP	21 17 50		
31	(W)Z,Z	eP	01 18 15	81° .8	H - 01:05:53.
	(L)N	1S	28 28	9090	USCGS: H - 01:05:53.
	(L)N	eL	47.1		52° N , 175½° W. Andreanof Islands, Aleutian Islands. Mag: 5¼ - 6 (Pas.)



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
31	(W)Z,Z (W)E	eP e(S)	03 04(13) 08 23		
31	(W)Z	iP	09 06 05		Dilatation.
31	(W)Z	e	21 53(01)		

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PAKISTAN METEOROLOGICAL SERVICE

Director: S. N. NAQVI

GEOPHYSICAL REVIEW

Vol. I. 1955

Part I. Seismology

No. 13.

Seismological Bulletin

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QUETTA OBSERVATORY

November, 1955.

DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
1	(W)Z	e	08 57 38		
1	(W)Z,Z (L)E	eP e	09 00 42 11 19		
1	(W)Z (L)N	eP eSKS	10 25 07 35 38		USCGS: H - 10:12:09. 5° S. , 153° E. New Britain region.
1	(W)Z (W)Z (L)N (L)E	eP i eS i	23 56 35 45 00 04 59 06 36	62°.0 6890	Compression. H - 23:46:11. USCGS: H - 23:46:10. 39½° N. , 144° E. Off east coast of Honshu, Japan.
2	(W)Z	e	05 11 08		USCGS: H - 04:52:11. Kermadec Islands.
2	(W)Z	eP	07 48 03		USCGS: H - 07:37:54. Near north coast of Honshu, Japan.
2	(W)Z	e	08 55 34		
2	(W)Z	e	16 59 06		
2	(W)Z	e	17 31 55		
2	(W)Z,Z	eP	18 46 18		USCGS: H - 18:36:00. 5° N. , 126° E. Off south coast of Mindanao, Phillipine Islands.
3	(W)Z (W)Z (W)Z Z	ePKP epPKP ePP epPP	12 59 21 52 13 02 11 43		USCGS: H - 12:39:56. Depth: about 100 km. Bolivia-Chile border.
4	(W)Z	e	01 56 56		
4	(W)Z,Z	e	02 07(00)		
4	(W)Z,Z (W)E Z Z,(L)E (L)E (L)E (L)E (L)E	ePKP epPKP i iPP i i iSS isSS	23 03 26 55 04 19 06 54 13 32 14 18 25 22 26 02		Compression. USCGS: H - 22:43:50. Depth: about 100 km. 35½° S. , 69½° W. Mendoza Province, Argentina. Mag: 6¼ (Pas.)
5	(W)Z,Z Z	e e	12 33 25 38		USCGS: H - 12:23:15. Off east coast of Mindanao, Phillipine Islands.



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
6	(W)Z,Z	e	01 15 39		
6	(W)Z	e	22 26 22		USCGS: H - 22:07:33. Depth: about 100 km. 25 $\frac{1}{2}$ $^{\circ}$ S. , 177 $\frac{1}{2}$ $^{\circ}$ W. Kermadec Islands region.
7	(W)Z,Z	eP	14 01 52		
9	(W)Z,Z	iP	01 26 41		Dilatation.
9	(W)Z	e	15 47 44		
9	(W)Z,Z	iP	22 07 50		Dilatation. USCGS: H - 21:58:45. Near east coast of Madagascar.
10	Z	eP	01 37 29	91 $^{\circ}$ .4	Compression.
	(W)E	e	38	10150	H - 01:24:20.
	(W)E	e	45		USCGS: H - 01:24:20.
	(L)E	eSKS	48 00		5 $^{\circ}$ S. , 152 $^{\circ}$ E.
	(L)E	i	07		New Britain region.
	(L)E	eS	27		
10	Z	ePKP	02 02 53		USCGS: H - 01:44:04.
	(L)E	iSKS	09 50		Depth: about 100 km.
	(L)E	i	11 26		15 $^{\circ}$ S. , 174 $^{\circ}$ W.
	(L)N	eSS	20 56		Samoa Islands.
	(L)N	iSSP	21 14		Mag: 7 $\frac{1}{4}$ - 7 $\frac{1}{2}$ (Pas.)
	(L)N	e	22 07		
10	(W)E	ePKP	05 29 13		USCGS: H - 05:10:20. 28 $\frac{1}{2}$ $^{\circ}$ S. , 178 $\frac{1}{2}$ $^{\circ}$ W. Kermadec Islands region.
10	Z, (W)E	e	05 44 09		
10	(W)E	e	09 11 27		USCGS: H - 08:52:04. Depth: about 150 km. 25 $^{\circ}$ S. , 65 $^{\circ}$ W. Salta Province, Argentina.
11	(W)Z	e	08 44 53		USCGS: H - 08:31:11.
	(W)Z	ePP	48 55		South Atlantic Ocean, about 400 miles north of Tristan da Cunha.
11	(W)Z	ePKP	10 56 02		USCGS: H - 10:37:03. Tonga Islands region.
11	(W)Z	e	11 38 35		
12	(W)E,Z	iP	05 38 18		Dilatation.
	(L)E	ePcP	41 28		USCGS: H - 05:32:18.
	(L)E	iL	44.0		26 $^{\circ}$ N. , 35 $^{\circ}$ E. Northern Red Sea.
12	(W)E,Z	e	10 01 54		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
12	(W)E,Z Z E (L)N (L)N	eP i epP iS isS	10 20 47 50 21 02 31 29 32 13	89 <sup>o</sup> .4 9930	Compression. H - 10:07:56. Depth: about 60 km. USCGS: H - 10:07:47. Depth: about 60 km. 5 <sup>o</sup> S. , 152 $\frac{1}{2}$ <sup>o</sup> E. New Britain.
12	(W)E,Z (L)N, (M)E	iP e	11 22 15 30 24		Compression. USCGS: H - 11:12:25. 11 $\frac{1}{2}$ <sup>o</sup> N. , 125 $\frac{1}{2}$ <sup>o</sup> E. Samar Island, Philippine Islands.
12	(W)E,Z (W)E	ePKP e	12 37 35 38 11		USCGS: H - 12:19:44. Depth: about 600 km. 22 $\frac{1}{2}$ <sup>o</sup> S. , 179 <sup>o</sup> E. South of Fiji Islands.
12	(W)E,Z Z (L)N	eP e e(S)	13 56 01 25 14 06 43		USCGS: H - 13:43:00. New Britain region.
12	(W)E	e	23 02 20		
13	Z	e	03 44 51		
13	(W)Z,Z (L)E	eP e	09 26 59 30 06		Dilatation.
14	Z Z	eP epP	01 27 44 28 02		Dilatation. USCGS: H - 01:16:04. Depth: about 100 km. 17 $\frac{1}{2}$ <sup>o</sup> N. , 146 <sup>o</sup> E. Marianas Islands.
14	(W)E,Z Z (W)E,Z	eP e e	03 23 03 26 54 27 16		USCGS: H - 03:09:10. Depth: about 200 km. 14 <sup>o</sup> S. , 167 <sup>o</sup> E. New Hebrides Islands.
14	(W)E,Z (L)E	eP eSKS	13 21 07 31 41		USCGS: H - 13:08:07. 5 $\frac{1}{2}$ <sup>o</sup> S. , 152 $\frac{1}{2}$ <sup>o</sup> E. Near coast of New Britain.
14	Z Z (L)E (L)N (L)N	eP epP isP iS esS	13 34 22 58 35 16 43 34 44 32	73 <sup>o</sup> .0 8110	H - 13:23:08. Depth: about 150 km. USCGS: H - 13:23:09. Depth: about 150 km. 17 $\frac{1}{2}$ <sup>o</sup> N. , 145 $\frac{1}{2}$ <sup>o</sup> E. Marianas Islands.
15	(W)E,Z	eP	03 29 34		USCGS: H - 03:16:32. 5 <sup>o</sup> S. , 154 <sup>o</sup> E. Solomon Islands region.



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
15	Z (W)E,Z (W)E (W)E,Z (L)N (L)NE	eP e e ePP iSKS iS	10 19 37 47 57 23 01 30 04 18	87°.6 9730	H - 10:06:46. USCGS: H - 10:06:49. 55½° N. , 155° W. Off south coast of Alaska Peninsula. Mag: 6¼ (Pas.) 6 (Berk.)
15	(W)E	e	14 15 48		
15	(W)E,Z (W)E	eP e	15 31 28 32 26		
15	(W)Z (W)N	iP iS	21 11 34 12 43	5°.9 650	Dilatation. H - 21:10:03.
15	(W)Z,Z (L)NE (L)N	eP eS i	22 15 37 19 23 36	20°.6 2290	H - 22:10:54. USCGS: H - 22:10:53. 43½° N. , 87° E. Sinkiang Province, China.
16	(W)Z,Z	e	06 50 16		
16	(W)Z,Z (L)E	ePKP eSS	09 24 40 41 49		USCGS: H - 09:05:54. Sandwich Islands.
16	(W)Z	eP	14 46 08		USCGS: H - 14:33:57. Andreanof Islands, Aleutian Islands.
17	(W)Z,Z (L)N	eP e(S)	00 03 56 12 06		
17	(W)Z	eP	03 57 06		USCGS: H - 03:44:05. 5° S. , 154° E. Solomon Islands region.
17	(W)Z,Z Z Z Z (L)E (L)E (L)E (L)E	ePKP epPKP esPKP ePP i iSKKKS iSS isSS	07 12 57 13 10 24 16 05 09 23 24 34 40 35 01		USCGS: H - 06:53:27. Depth: about 60 km. 26½° S. , 69° W. Northern Chile.
17	(W)Z	e	14 10 15		
17	(W)Z,Z	e	15 48 55		
17	(W)Z	e	17 27 00		
17	(W)Z	e	21 17 01		
18	(W)Z,Z N (L)E,E (L)E	eP e(S) e i	11 01 41 05 53 58 06 10		



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			h.	m.	s.		
18	(W) Z, Z	eP	15	09	35		
	Z	e			40		
	(W) E	i		10	04		
18	(W) Z	e	17	15	48		
18	(W) Z	e	17	37	50		
19	(W) Z	eP	00	41	59		
19	(W) Z	ePKP	08	44	04		USCGS: H - 08:25:32. 17 $\frac{1}{2}$ <sup>o</sup> S. , 168 <sup>o</sup> E. New Hebrides Islands.
20	(W) Z, Z	e	17	12	24		
20	(W) Z	eP	18	19	12		
21	(W) Z	ePKP	21	22	55		USCGS: H - 21:04:00. 38 <sup>o</sup> S. , 178 <sup>o</sup> E. Near east coast of North Island, New Zealand.
	(W) E	e		23	05		
21	(W) Z	e	21	32	54		
22	(W) Z, Z	ePKP	03	44	15		USCGS: H - 03:24:00. 24 $\frac{1}{2}$ <sup>o</sup> S. , 123 <sup>o</sup> W. Eastern Tuamotu Archipelago. Mag: 6 $\frac{3}{4}$ - 7 (Pas.)
	(W) Z, Z	e		45	29		
	(L) E	ePP		49	12		
	(L) E	i		57	37		
	(L) E	i		59	49		
	(L) E	i	04	01	29		
	(L) N	eSS		10	18		
22	(W) Z, Z	e	07	39	15		
22	(W) Z, Z	eP	17	18	22		Dilatation. USCGS: H - 17:05:22. New Britain.
	(W) Z, Z	e			34		
	Z	e			39		
22	(W) Z	e	18	02	16		
23	Z	e	01	22	49		
23	(W) Z, Z	eP	02	38	35	20 <sup>o</sup> .7	H - 02:33:50. USCGS: H - 02:33:47. 24 $\frac{1}{2}$ <sup>o</sup> N. , 90 <sup>o</sup> E. Bhutan-Pakistan border.
	(W) E, E	eS		42	22		
23	(W) Z, Z	ePKP	03	33	39		USCGS: H - 03:14:36. Depth: about 150 km. 14 <sup>o</sup> N. , 90 <sup>o</sup> W. Near coast of Guatemala.
23	(W) Z, Z	eP	06	40	22	67 <sup>o</sup> .7 7520	H - 06:29:30. Depth: about 60 km. USCGS: H - 06:29:29. Depth: about 60 km. 50 $\frac{1}{2}$ <sup>o</sup> N. , 157 <sup>o</sup> E. Near south coast of Kamchatka. Mag: 7 - 7 $\frac{1}{4}$ (Pas.)
	Z	epP			35		
	E	esP			42		
	(L) N	iS		49	12		
	(M) E	esS			40		
	(M) E	e		54	49		
	Z	eP'P'	07	08	41		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
23	(W)Z	eP	06 52 34		
23	(W)Z,Z	e	08 43 19		
23	Z	e	11 29 57		
23	(W)Z	e	17 33 19		
23	(W)Z,Z	eP	21 40 29		
24	(W)Z,Z (L)N	eP iS	05 00 20 07 29	49 <sup>o</sup> .7 5520	H - 04:51:24. USCGS: H - 04:51:20. 19 <sup>o</sup> N. , 120 <sup>1</sup> / <sub>2</sub> E. Near north coast of Luzon.
24	(W)Z,Z Z	eP ePcP	11 21 28 55		USCGS: H - 11:10:32. 51 <sup>o</sup> N. , 157 <sup>o</sup> E. Near south coast of Kamchatka.
24	(W)Z,Z (W)E	iP iS	22 24 04 25 22	6 <sup>o</sup> .7 740	Dilatation. H - 22:22:22.
25	(W)Z	e	03 52 32		
25	(W)Z,Z	eP	08 43 25		Compression. USCGS: H - 08:33:13. 45 <sup>o</sup> N. , 143 <sup>o</sup> E. Hokkaido, Japan.
26	(W)Z,Z (L)N	iP iS	07 58 58.8 59 21.3	1 <sup>o</sup> .6 180	Compression. H - 07:58:29.
27	(W)Z (W)Z	ePKP e	07 23 59 24 03		USCGS: H - 07:05:07. Depth: about 100 km. 24 <sup>1</sup> / <sub>2</sub> S. , 177 <sup>1</sup> / <sub>2</sub> W. Tonga Islands region.
27	(W)Z	eP	13 19 28		USCGS: H - 13:06:50. 57 <sup>1</sup> / <sub>2</sub> N. , 156 <sup>1</sup> / <sub>2</sub> W. Alaska Peninsula.
27	(W)Z,Z	iP	17 27 47		Dilatation. USCGS: H - 17:17:24. Depth: about 600 km. Marianas Islands.
27	(W)Z,Z N	eP eS	19 39 41 47 01	51 <sup>o</sup> .5 5720	H - 19:30:32. USCGS: H - 19:30:35. Off east coast of Formosa.
27	(W)Z,Z (W)Z	iP e	21 38 54 39 01		Dilatation. USCGS: H - 21:29:05. Depth: about 500 km. Banda Sea.
28	(W)Z	e	01 41 33		USCGS: H - 01:30:26. Near east coast of Kamchatka.



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			h.	m.	s.		
28	(W)Z	e	04	37	12		USCGS: H - 04:24:43. Andreanof Islands, Aleutian Islands.
28	(W)Z (L)E (L)N.	ePKP e eSS	18	40(37)			USCGS: H - 18:21:39. Samoa Islands region.
29	(W)Z,Z	e	04	07	01		USCGS: H - 03:57:57. 19 $\frac{1}{2}$ <sup>o</sup> N. , 121 <sup>o</sup> E. Off north coast of Luzon, Philippine Islands.
29	(W)Z,Z	e	06	17	03		USCGS: H - 06:04:52. 37 $\frac{1}{2}$ <sup>o</sup> N. , 34 <sup>o</sup> W. Azores region.
29	(W)Z,Z (W)Z	iP e	09	44	15 25		Compression. USCGS: H - 09:31:12. Solomon Islands.
29	(W)Z	e	16	28	14		
29	(W)Z	e	19	33	32		USCGS: H - 19:22:33. Central Kamchatka.
30	(W)Z,Z (W)Z,Z	e e	15	04	52 08 13		

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PAKISTAN METEOROLOGICAL SERVICE

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GEOPHYSICAL REVIEW

Vol. I. 1955

Part I. Seismology

No. 14.

Seismological Bulletin

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1	(W)Z (W)Z	eP e	08 51 16 41		USCGS: H - 08:38:13. Solomon Islands region.
2	Z	eP	01 03 46		
2	(W)Z,Z (L)N (L)N	eP eS i	10 26 11 30 51 59	27 <sup>o</sup> .5 3050	H - 10:20:21.
2	(W)Z,Z	e	13 34 39		Compression.
2	(W)Z	e	16 32 29		
2	(W)Z,Z	eP	16 53 45		Dilatation.
2	(W)Z,Z	e	23 27 30		
3	(W)Z,Z E (L)N	eP e eS	03 18 42 19 00 22 30	20 <sup>o</sup> .8 2310	H - 03:13:57.
3	(W)Z	eP	14 37 33		USCGS: H - 14:27:54. 35 $\frac{1}{2}$ <sup>o</sup> N. , 135 <sup>o</sup> E. Southern Honshu, Japan.
4	(W)Z,Z	ePKP	02 20 30		Compression. USCGS: H - 02:01:34. 33 $\frac{1}{2}$ <sup>o</sup> S. , 180 <sup>o</sup> . Kermadec Islands region.
4	(W)Z	e	02 37 42		
4	(W)Z,Z	eP	03 23 59		
4	(W)Z,Z (L)N	eP eS	14 05 54 08 50	16 <sup>o</sup> .3 1810	H - 14:02:02. USCGS: H - 14:02:08. 34 <sup>o</sup> N. , 49 <sup>o</sup> E. Central Iran.
5	(W)Z,Z (L)E	eP eS	07 32 03 35 44	20 <sup>o</sup> .1 2230	H - 07:27:25. (From travel time of P only). 30 <sup>o</sup> N. , 91 <sup>o</sup> E, Tibet. Lahore P - 07:30:38. S - 33 09. USCGS: H - 07:27:22. Southeastern Tibet.
5	(W)Z (L)N	eP eS	12 11 33 15 22	20 <sup>o</sup> .9 2320	H - 12:06:46. USCGS: H - 12:06:55. Southern Tibet.
5	(W)Z	ePKP	14 46 05		USCGS: H - 14:26:46. Depth: about 150 km. 23 $\frac{1}{2}$ <sup>o</sup> S. , 67 <sup>o</sup> W. Jujuy Province, Argentina.



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5	(W)Z	e	16 25 48		
5	(W)Z,Z	eP	20 23 14		USCGS: H - 20:14:18. 24°N. , 122½°E. Off east coast of Formosa.
5	(W)Z	e	23 00 26		
6	(W)Z,Z (L)E (L)NE	ePKP ePP eSS	04 50 30 53 30 05 11 51	140°0 15550	H - 04:31:00. (From PKP and SS). USCGS: H - 04:31:00. 20°S. , 70°W. Northern Chile. Mag: 6¼ (Pas.)
6	(W)Z,Z (W)Z	e i	06 12 51 13 14		
6	Z	e	11 03 39		
6	Z	e	18 29 37		
7	(W)Z,Z (M)E (W)Z,Z	eP eS eP'P'	15 13 58 22 39 42 42	64°9 7210	Compression. H - 15:03:15. USCGS: H - 15:03:11. 26½°N. , 142½°E. Bonin Islands. Mag: 6¾ - 7 (Pas.)
7	(W)Z	e	15 34 39		
7	(W)Z	e	15 43 31		
7	(W)Z	ePKP	16 28 21		Dilatation. USCGS: H - 16:09:45. Depth: about 200 km. Tonga Islands region.
7	(W)Z	eP	16 39 19		
7	(W)Z	e	19 00 25		
7	(W)Z	e	19 41 50		
7	(W)Z	e	21 50 05		
7	(W)Z	iP	23 02 51		Dilatation. USCGS: H - 22:53:27. 26°N. , 128½°E. Ryukyu Islands.
8	(W)Z	eP	00 29 26		
8	(W)Z	eP	02 16 42		USCGS: H - 02:08:03. Near south coast of Sumatra.
8	(W)Z	e	02 46 01		



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8	(W)Z,Z (W)E	eP eS	11 32(20) 34 23		
8	(W)Z,Z (W)E	eP eS	11 35(25) 37 29		
8	(W)Z,Z	eP	12 18 59		Dilatation.
8	(W)Z,Z Z (L)NE (L)N	iP ipP esKS esS	17 48 01 49 43 57 44 18 00 55		Compression. USCGS: H - 17:36:00. Depth: about 500 km. 4°S. , 152°E. New Britain region.
8	(W)Z	e	19 54 36		
8	(W)Z	eP	22 04 09		USCGS: H - 21:58:03. 45°N. , 99½°E. Outer Mongolia.
9	(W)Z,Z	eP	04 12 36		
9	(W)Z,Z	eP	08 37 44		
9	(W)Z	ePKP	09 17 10		USCGS: H - 08:58:08. Kermadec Islands.
10	(W)Z,Z	eP	04 05 38		Dilatation.
10	(W)Z,Z	eP	04 21 32		Dilatation.
10	(W)Z	eP	11 38 40		
10	(W)Z	e	18 51 19		
10	(W)Z,Z	eP	20 34 37		USCGS: H - 20:24:14. 64½°N. , 154°E. Northeastern Siberia.
10	(W)Z	e	22 25 27		
11	(W)Z	e	00 07 22		
11	(W)Z (W)Z	ePKP e	03 46 06 47 40		USCGS: H - 03:27:08. Kermadec Islands.
11	(W)Z,Z (W)NE,(L)NE,E	iP iS	05 44 30 45 54	7°.25 800	Dilatation. H - 05:42:40. (From travel time of P). 36½°N. , 71½°E. Hindukush. Lahore P = 05:44:05. S = 45:07. USOGS: H - 05:42:28. Hindukush.
11	(W)Z	eP	07 33 29		USCGS: H - 07:22:30. Central Kamchatka.



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
11	(W)Z	eP	08 43 27		USCGS: H - 08:33:19. Depth: about 60 km. 40 $\frac{1}{2}$ $^{\circ}$ N. , 143 $^{\circ}$ E. Near north coast of Honshu, Japan.
12	(W)Z (W)E	ePKP e	02 52 31 55 06		USCGS: H - 02:33:00. Northern Chile.
12	Z	iP	09 09 05		Dilatation. USCGS: H - 08:58:49. 5 $^{\circ}$ N. , 126 $^{\circ}$ E. Near south coast of Mindanao, Phillipine Islands.
12	Z Z	eP epP	09 38 32 39 04		USCGS: H - 09:29:03. Depth: about 150 km. 36 $^{\circ}$ N. , 140 $\frac{1}{2}$ $^{\circ}$ E. Near east coast of Honshu, Japan.
13	Z	e	07 11 16		
13	(W)Z,Z (W)Z,Z	eP e	13 47 42 48 08		USCGS: H - 13:37:24. 0 , 123 $\frac{1}{2}$ $^{\circ}$ E. Northern Celebes.
13	(W)Z	e	20 15 01		
14	(W)Z	e	04 42 09		
14	(W)Z	e	06 33 11		
14	(W)Z,Z (W)E,N	eP e(S)	07 31 50 33 43		
14	(W)Z Z Z (L)N	iP ipP isP iS	10 57 08 18 29 11 01 33	24 $^{\circ}$ .9 2770	Compression. H - 10:51:47. (From travel times of P). 22 $^{\circ}$ N. , 93 $^{\circ}$ E. Burma. Felt Chittagong and Comilla, East Pakistan. USCGS: H - 10:51:44. 22 $^{\circ}$ N. , 92 $\frac{1}{2}$ $^{\circ}$ E. Pakistan-Burma border.
14	(W)Z,Z	eP	12 34 17		USCGS: H - 12:22:15. 51 $\frac{1}{2}$ $^{\circ}$ N. , 178 $^{\circ}$ E. Rat Islands, Aleutian Islands.
14	(W)Z	e	18 00 01		
14	(W)Z,Z	ePKP	20 20 45		USCGS: H - 20:01:05. 30 $^{\circ}$ S. , 69 $^{\circ}$ W. Mendoza Province, Argentina.
15	(W)Z,Z	e	01 28 07		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
15	(W)Z	e	01 37 13		
15	(W)Z,Z	ePKP	01 39 09		USCGS: H - 01:19:00. Easter Island region.
15	(W)Z,Z	e	03 10 08		
15	(W)Z,Z	eP	10 27 43		Compression.
15	(W)Z,Z	eP	14 08 52		Dilatation. USCGS: H - 13:58:32. Bonin Islands region.
15	(W)Z (L)E	eP eS	19 15 19 25 51	85°.6 9520	H - 19:02:38. USCGS: H - 19:02:43. 3½°S. , 149°E. Bismarck Sea.
15	(W)Z,Z	eP	21 46 30		Dilatation.
16	(W)Z,Z	e	07 19 49		
17	E,Z (L)N	eP iS	08 10 29 13 29	16°.2 1800	H - 08:06:39. USCGS: H - 08:06:42. 33½°N. , 49°E. Western Iran.
17	(W)Z,Z (W)E,E	iP iS	08 18 21 19 38	6°.6 730	Dilatation. H - 08:16:40. USCGS: H - 08:16:37. Depth: about 200 km. 37°N. , 70½°E. Hindukush.
17	(W)Z	e	15 12 47		
17	(W)Z,Z (W)N	iP iS	17 21 47.3 22 00.5		Compression.
17	(W)Z	eP	23 48(36)		
18	Z	e	00 06 20		
18	(W)Z,Z	eP	02 38 06		
18	(W)Z,Z	eP	02 52 43		
18	(W)Z,Z	eP	05 43 10		Compression. USCGS: H - 05:33:10. Depth: about 60 km. 36½°N. , 139½°E. Central Honshu, Japan.
18	(W)Z	eP	06 37 36		USCGS: H - 06:27:45. 35°N. , 134½°E. Southern Honshu, Japan.
18	(W)Z,Z (L)N	eP eS	08 59 19 09 04 12	29°.3 3250	H - 08:53:13.
18	(W)Z,Z	e	15 43 59		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
18	(W)Z	e	18 00 30		
18	(W)Z,Z E	eP eS	22 02 08 05 54	20 <sup>o</sup> .6 2290	H - 21:57:25. USCGS: H - 21:57:30. 30 <sup>o</sup> N. , 90 <sup>o</sup> E. Eastern Tibet.
18	(W)Z	eP	22 09 20		Dilatation?
18	(W)Z,Z (L)N	iP eS	22 42 23 46 09	20 <sup>o</sup> .6 2290	H - 22:37:40. USCGS: H - 22:37:45. 30 <sup>o</sup> N. , 90 <sup>o</sup> E. Eastern Tibet.
19	(W)Z,Z	iP	03 23 55		Compression. USCGS: H - 03:13:46. 81 <sup>o</sup> N. , 127 <sup>o</sup> E. Near east coast of Mindanao Island, Phillipine Islands.
19	(W)Z	e	11 14 29		
19	(W)Z,Z (W)N	iP eS	11 27 38 28 50		Dilatation. H - 11:26:04. Hindukush. Lahore P - 11:27:24.
19	(W)Z,Z	eP	11 35 10		Dilatation?
19	(W)Z	eP	14 06 10		USCGS: H - 13:55:12. Central Kamchatka.
19	(W)Z	e	14 29 30		
19	(W)Z	e	14 53 01		
19	(W)Z	e	17 10 05		
19	(W)Z	e	20 01 39		
20	(W)Z,Z (W)Z,Z	eP i	13 52 13 21		
20	(W)Z,Z	e	14 04 05		
20	(W)Z,Z	e	15 29 51		
20	(W)Z	e	20 00 06		
20	(W)Z	eP	23 37 27		
21	(W)Z	eP	03 14 28		Dilatation? USCGS: H - 03:03:32. Central Kamchatka.
21	(W)Z,Z Z	eP e	07 07 44 56		
21	(W)Z	eP	09 30 12		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
21	(W)Z (W)E	eP eS	13 04 36 06(46)		
21	(W)Z	eP	19 06 36		
21	(W)Z	eP	20 00 24		USCGS: H - 19:54:54. 44°N. , 40°E. Southern Russia.
22	(W)Z (W)E	eP e(S)	03 47(07) 51 42		
22	(W)Z	e	08 41 13		USCGS: H - 08:30:43. 40°N. , 145°E. Off east coast of Honshu, Japan.
22	(W)Z,Z	ePKP	10 28 20		USCGS: H - 10:09:37. Depth: about 150 km. 18°S. , 176°W. Tonga Islands region.
22	(W)Z,Z	ePKP	10 28 48		Dilatation. USCGS: H - 10:09:10. Galapagos Islands.
22	(W)E	e	11 18 09		
22	(W)Z,Z (W)Z	eP e	14 05 41 52		
22	(W)Z	eP	20 40 32		USCGS: H - 20:29:43. 23 $\frac{1}{2}$ °N. , 141 $\frac{1}{2}$ °E. Volcano Islands.
22	(W)Z	e	22 09 01		
23	(W)Z	e	01 59 31		
23	(W)Z	e	07 34 12		
23	(W)Z,Z	eP	10 49 53		
23	(W)Z,Z	eP	17 50 56		
23	(W)Z	e	23 35 05		USCGS: H - 23:24:10. Northern Kurile Islands.
24	(W)Z	eP	06 44 05		Dilatation.
24	(W)Z	e	06 50 14		
24	(W)Z,Z	eP	13 16 15		Dilatation.
24	(W)Z	e	18 09 23		
24	(W)Z	e	21 42 57		
25	(W)Z	e	03 27 15		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
25	(W)Z	e	10 49 51		USCGS: H - 10:38:49. Near south east coast of Kamchatka.
25	(W)Z	eP	16 15 33		
25	(W)Z	e	18 48 52		
25	(W)Z,Z	eP	21 49 42		
26	(W)Z E	iP eS	03 35 01 36 20	7 <sup>0</sup> .0 780	Dilatation. H - 03:33:20. (From travel times of P). Depth: about 200 km. 36 <sup>1</sup> / <sub>2</sub> °N. , 71°E. Hindukush. Lahore P = 03:34:40. S = 35:38.
26	(W)Z,Z (L)N	eP eS	07 20 34 24 24	21 <sup>0</sup> .0 2330	H - 07:15:47.
26	(W)Z	eP	08 49 19		
26	(W)Z,Z	eP	09 18 07		USCGS: H - 09:08:43. 30 <sup>1</sup> / <sub>2</sub> °N. , 130°E. Off south coast of Kyushu, Japan.
26	(W)Z (W)N	iP iS	17 14 46.6 48.1		Compression. Felt in Quetta.
26	(W)Z	e	19 47 39		
27	(W)Z	ePKP	02 46 35		USCGS: H - 02:27:54. Depth: about 200 km. 26°S. , 177°W. Kermadec Islands region.
27	(W)Z,Z	eP	08 07 16		
27	(W)Z	e	08 48 27		
27	(W)Z,Z Z (L)N (L)E	eP epP eS isS	08 58 43 59 15 09 08 11 54		Dilatation? H - 08:47:11. Depth: about 100 km. USCGS: H - 08:47:15. Depth: about 100 km. 14°N. , 145°E. Marianas Islands.
27	(W)Z,Z	eP	10 07 34		
27	(W)Z	e	16 28 17		
27	(W)Z	ePKP	17 38 58		USCGS: H - 17:20:42. Depth: about 400 km. 32°S. , 180°. Kermadec Islands.
27	(W)Z	e	17 48 51		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
27	(W)Z	ePKP	18 49 54		USCGS: H - 18:30:20. Northern Chile.
28	(W)Z,Z (W)E,N	iP eS	08 16 09 17 32	7 <sup>o</sup> .2 800	Dilatation. H - 08:14:20.
28	(W)Z (W)E	eP eS	19 57 25 58 41	6 <sup>o</sup> .7 740	H - 19:55:48. Depth: about 200 km. Hindukush. Lahore P = 19:57:13. S = 58:16.
29	(W)Z,Z	eP	05 04 19		Compression. USCGS: H - 04:53:43. 44 <sup>o</sup> N. , 148 <sup>o</sup> E. Kurile Islands.
29	(W)Z,Z N	iP eS	08 30 11 33 52	20 <sup>o</sup> .1 2230	Compression. H - 08:25:33. (From travel times of P). 30 <sup>o</sup> N. , 90 <sup>o</sup> E. Eastern Tibet. Lahore P = 08:28:50. S = 31:20. USCGS: H - 08:25:33. 30 <sup>o</sup> N. , 90 <sup>o</sup> E. Eastern Tibet.
29	(W)Z,Z N	eP eS	11 52 53 56 35	20 <sup>o</sup> .2 2240	H - 11:48:14. Eastern Tibet aftershock.
29	(W)Z,Z	eP	16 17 10		Dilatation? USCGS: H - 16:04:45. Depth: about 100 km. 59 <sup>o</sup> 1/2 <sup>o</sup> N. , 154 <sup>o</sup> W. Southern Alaska.
29	(W)Z	e	18 33 36		
29	(W)Z	e	21 56 41		
30	(W)Z,Z	iP	07 08 26		Dilatation. USCGS: H - 06:57:51. 1/2 <sup>o</sup> N. , 126 <sup>o</sup> E. Molucca Passage.
30	(W)Z,Z	ePKP	09 44 04		Dilatation. USCGS: H - 09:26:13. Depth: about 600 km. Fiji Islands region.
31	(W)Z,Z	ePKP	05 19 33		USCGS: H - 05:00:06. 18 <sup>o</sup> S. , 69 <sup>o</sup> 1/2 <sup>o</sup> W. Peru - Chile border.
31	(W)Z,Z	e	05 22 48		



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DATE	COMPT.	PHASE	GMT h. m. s.	$\Delta$ km.	REMARKS
31	(W)Z,Z N	iP eS	21 24 20 32 29	59 <sup>o</sup> .5 6610	Compression. H - 21:14:13. USCGS: H - 21:14:11. 42 <sup>o</sup> N. , 142 <sup>o</sup> E. Near south coast of Hokkaido, Japan.

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